INSIDE: MARMOT ON MAIN STREET

Montana Outdoors

MONTANA FISH,

SEPTEMBER–OCTOBER 2021

Return of the BIGHORNS

IN THIS ISSUE:

WHEN DOVES FLY
WHERE RIFLES AREN'T ALLOWED
MY LIFE WITH POINTERS AND RETRIEVERS
THE ART AND SCIENCE OF COUNTING WILDLIFE

Montana Outdoors

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Montana Outdoors

SEPTEMBER–OCTOBER 2021

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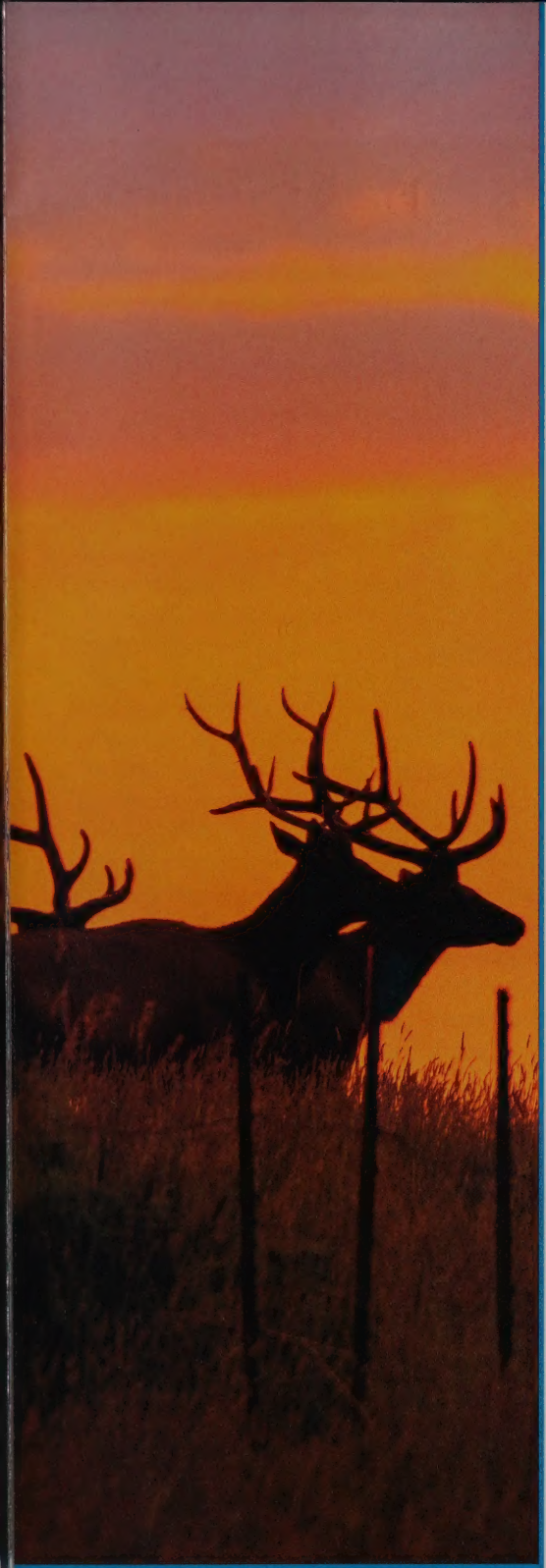


COUNTING BULLS FWP wildlife biologists keep close tabs on elk, deer, and other wildlife populations throughout the year. See page 16 to learn why this information is essential for managing wildlife. Photo by Gary Beeler.

FRONT COVER Biologists are cautiously, carefully returning bighorn sheep to suitable habitats. See page 36 to learn why FWP isn't putting the prized big game animals just anywhere. Photo by Chris Auch.

LETTERS

Bearded lady

Great issue of your magazine. My husband and I especially like the picture of the turkey with the chicks. The article says it's a hen, but then we saw it has a beard like on the male turkeys we see around our house.

Aimee Nielson
Kalispell

EDITOR REPLIES: Many readers wrote praising the photo by Robert Cook in the May-June issue showing a hen with her five poults sitting in a tree. Several pointed out that the hen has a beard. According to Collin Smith, district biologist for Montana with the National Wild Turkey Federation, beards grow out of the chests of all male (tom) turkeys, "but anywhere from 5 to 20 percent of females can also exhibit beards based on a local population's propensity for this genetic trait anomaly."

This cluster of filaments resembles a miniature horse tail, though it is not made of hair but rather stiff, featherlike structures called mesofiloplumes, Smith says. "Bearded" hens usually have shorter and thinner beards, 3 to 4 inches long, compared to a tom's, which can reach up to a foot. "But what positively defines this wild turkey as a hen in the photo is the buff coloration located on the leading edges of her breast feathers," Smith says. "Toms exhibit black leading edges." Smith adds that the maternal behavior of this hen roosting and sheltering her brood also indicates its sex: "A male wild turkey takes no part in the rearing and care of young."

Just one man's opinion

I am looking forward to the next issue of *Montana Outdoors*. What a professional magazine. Lots of hard work and devotion must go into it. And you all must have so much fun putting it together and getting the information and pictures for the articles. Also, you don't charge enough for the subscription.

Paul Williamson
Livingston

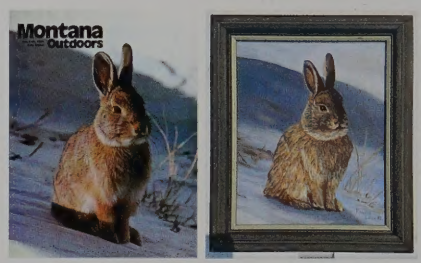
Cover inspires family painting heirloom

Your 50th anniversary issue (March-April) brought me unexpected joy. First, proving just how "small town" Montana is, I recognized a quote in your letters section from a friend's dad, who wrote that letter before my friend or I were born. I had fun texting her a picture of the letter.

Next—and I was really hoping you would do this—I saw the pullout with all 300 covers from the previous 50 years. Just a few weeks ago, I was rearranging some artwork my grandmother had painted years ago. On the back of one canvas, in a handwritten note, she wrote that the painting was "based on a photo by Mike Aderhold from the cover of *Montana Outdoors*."

The painting is of a cottontail from the January-February 1981 issue. As a boy, I admired that painting hanging on my grandparents' walls. When I graduated from high school, my grandmother asked which one of her paintings I would like for a gift. With no hesitation I chose the one I had so long admired, and it has been hanging on the walls of wherever I have called home for more than 20 years.

Congratulations on 50 years, and keep up the great work. Your magazines have dotted the coffee tables of my family members' homes through the years.



We often pass *Montana Outdoors* around at gatherings and talk about specific pictures and intriguing stories. Thank you for all you do and this unexpected trip down memory lane.

Jess Lohse
Havre

Not too welcome

Your "Howdy, new neighbors" essay (Sketchbook, May-June) was great. It would be wonderful if you would send that article to every real estate agent in the state so they may convey the essay's sentiments to potential buyers. Some people come with an attitude of trying to make Montana like the place they left. My advice to them is, "Stay where you came from and you will be happier."

Doug Black
Big Sky

Alien probing

Your Sketchbook essay ("Wonders under water," July-August), referencing NASA and Mars, reminded me of an experience I've long imagined that our own Yellowstone River pallid sturgeon endure. Many of these ancient fish have been surgically implanted by fisheries biologists with radio telemetry transmitters and are occasionally tracked down, captured, and transported to the federal Gavin's Point Hatchery in South Dakota, where they are spawned and then returned back home. Imagine the true but hard to believe tales they must tell afterward! Many people have claimed the same type of alien capture and probing. Who's to say pallids don't do the same?

Jack Austin
Miles City

Correction

In a caption in our July-August issue article on state parks and health ("A Healthy Dose of Nature"), we misspelled the city of Sidney as "Sydney." Eastern Montana may be far from the *Montana Outdoors* office, but it's not in Australia. Our apologies to Sidney residents current and former.

Speak your mind

We welcome all your comments, questions, and letters to the editor. We edit letters to meet our needs for accuracy, style, and length. Write to us at Montana Outdoors, *P.O. Box 200701, Helena, MT 59620-0701. Or e-mail us at: tdickson@mt.gov.*

General Tso's Pheasant

By Tom Dickson | Preparation time: 30 minutes | Cooking time: 40-45 minutes | Serves 2-4

INGREDIENTS

- 1½ lb. pheasant or mountain grouse breasts (or skinless chicken breasts or thighs), sliced into 1-inch cubes
- 1½ c. cornstarch
- ½ t. salt
- ½ t. freshly ground black pepper
- 3 c. vegetable oil for frying, plus 1 T. for stir-frying
- ¼ t. dried chili flakes
- 2 cloves garlic, minced
- 1 t. white sesame seeds, for garnish
- Scallions, thinly sliced, for garnish

MARINADE

- 1 T. soy sauce
- 1 T. white wine, vermouth, or dry sherry
- 2 egg whites

SAUCE

- ½ c. chicken stock or water
- 3 T. tomato paste
- 2 T. soy sauce
- 2 T. rice wine vinegar or white vinegar
- 2 t. hoisin sauce
- 2 t. chili paste (Sambal Oelek is a common brand)
- 2 t. sesame oil
- 2 T. sugar
- 2 t. cornstarch

DIRECTIONS

Marinade: In a large bowl, combine soy sauce, white wine (or vermouth or sherry), and egg whites. Coat the meat cubes in the marinade mixture and let sit for 10 minutes.

Sauce: In a small bowl, combine chicken stock, tomato paste, soy sauce, vinegar, hoisin sauce, chili paste, sesame oil, sugar, and 2 t. cornstarch. Stir until sugar and cornstarch dissolve. Set aside.

Meat: In another large bowl, toss the 1½ c. cornstarch with the salt and pepper. Coat the marinated meat in the cornstarch and shake off excess before frying.

Cooking: Heat 3 c. of oil in a deep pot until it reaches 350°F. Working in 2 or 3 batches, add the first batch of cubes and fry until golden brown on the outside and cooked through, about 4 to 5 minutes. Remove with a slotted spoon and drain on paper towels.

Heat a wok or skillet over medium-high heat and add 1 T. of oil. Add chili flakes and garlic and stir until just fragrant, about 20 seconds. Pour in sauce mixture and stir until thickened, about 1 to 2 minutes.

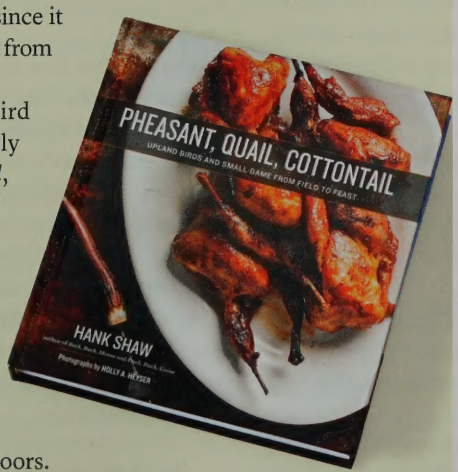
Add meat to wok or skillet, stir well to coat with sauce, and transfer to a serving dish. Garnish with sesame seeds and sliced scallions. Serve with cooked white rice and steamed broccoli or other vegetables. ■

Around this time of year, I start digging in the back of my basement freezer to see what remains from last year's hunting season. I always find a package or two labeled "Shot-Up Pheasant Breast." During the past months I've put off thawing and preparing these in favor of more-intact birds. But with upland season fast approaching, it's time to make room for the 2021 harvest.

Because it calls for bird meat cubes, this recipe is a great way to use pheasant or mountain grouse breasts that are a bit mangled, which usually comes from shooting the bird when it's too close or having it retrieved by a hard-mouthed dog. The dish also works well with intact breasts, or with skinless chicken breasts or thighs.

This delicious dish consists of marinated meat that is breaded, deep-fried, then coated in a sweet and spicy sauce. Found in Chinese restaurants worldwide, General Tso's Chicken was named after a 19th-century military leader, though no one knows why, since it was actually invented by a Taiwanese refugee from Hunan Province in the 1950s.

I learned about preparing game bird breasts this way from Hank Shaw's recently published *Pheasant, Quail, Cottontail*, hands down the best upland game bird cookbook I own. The version here is my own adaptation, drawn from Shaw's recipe and others I found online. All ingredients (other than the upland birds) can be found in chain grocery stores across Montana.



—Tom Dickson is the editor of Montana Outdoors.

SHUTTERSTOCK

Looking back helps with looking forward

Recently members of my staff and I met in Missoula with several Native American tribes to discuss the bison hunt around Yellowstone National Park. The meeting centered on the rights granted to Native Americans as part of the 1855 Treaty of Hellgate, an agreement between the United States and the Bitterroot Salish, Upper Pend d'Oreille, and Lower Kutenai tribes. Through the treaty, signed by President James Buchanan and ratified by Congress, the tribes ceded ownership of most of their traditional homelands while retaining key rights for cultural and subsistence use of those lands, which include the area around today's Yellowstone National Park. In our meeting, we talked mainly about ensuring public and hunter safety during the annual Yellowstone-area winter bison hunt, in which both tribal and non-tribal hunters (the latter through an FWP lottery) take part.

One thing that struck me during our discussion was the willingness of the various tribes in attendance to work together. Their efforts could be an example for FWP. Though administratively divided among separate divisions and bureaus, we need to recognize that all of us here at FWP have a common purpose of providing stewardship and recreational opportunities that benefit Montanans and visitors.

I was also inspired by the tribal leaders' deep understanding of their history and the modern relevance of legal documents like the Treaty of Hellgate, negotiated 166 years ago. For me, their historical insight underscored how important it is for FWP employees and others in Montana's conservation community to know our own history.

That includes understanding and accepting provisions of legal documents like the Treaty of Hellgate. It also means recognizing the achievements of western conservation leaders who came before us, people like President Teddy Roosevelt and George Bird Grinnell, as well as Montana's conservation heroes. These include inductees into the Montana Outdoor Hall of Fame such as Korean war veteran Thomas "Bearhead" Swaney, champion of the nation's first tribal-designated wilderness; Stan Meyer, past board chair of The Nature Conservancy and past chair of the Montana Fish and Wildlife Commission; legendary backcountry horseman and outfitter Smoke Elser; trout conservation legend Bud Lilly; and longtime wilderness advocate Doris Milner.

We also need to recognize the FWP giants on whose shoulders many of this agency's achievements rest: past employees such as wildlife biologist Bob Cooney, fisheries researcher Dick Vincent, state parks director Doug Monger, and Jeff Hagener, who was FWP director under three different governors.

Recognizing the achievements of these and other conservation leaders provides us with insight on how to manage the constantly changing political, social, and environmental landscapes affecting Montana's fish, wildlife, and state parks.

For instance, if 50 years ago FWP's wildlife managers, working with landowners, could bring Montana's elk populations back from the brink of near-extinction, I firmly believe that today's wildlife managers and landowners are equally capable of working together to find innovative ways to reduce overabundant elk herds and maintain them at population objectives.

Looking at what has been accomplished in the past can also give us a sense of belonging to something bigger than ourselves. It shows how we are part of a long stewardship tradition that has protected and restored wild lands, clean water, wildlife and fish populations, and cultural resources that contribute to Montana's high quality of life and tourism-based economy.

But looking back can help you move only so far forward.

Yes, FWP and conservationists across Montana have achieved great things. And we should recognize and learn from those accomplishments. But just as important as the conservation heroes of yesterday are the Bud Lillys and Doris Milners of tomorrow—the Eagle Scout who repairs state park trails while earning a merit badge; the 4-H club members helping care for injured wildlife; the young university researchers finding new and cost-effective ways to monitor bird populations; the recently hired FWP biologists, game wardens, IT specialists, technicians, and others who bring new insight and high-tech expertise to their professions.

Hilde Hamilton, 14, of Potomac, is an apprentice falconer who helps rehabilitate injured owls and other birds of prey at the Wild Skies Raptor Center. She and many other young people working on wildlife, fisheries, and parks projects across the state represent Montana's conservation future.

JESSE LEE VARNADO

We should definitely learn from and pay homage to Montana's storied conservation past. But let's also be sure to recognize the energy, enthusiasm, and achievements of those forging our state's conservation future.

—**Hank Worsech**, Director, Montana Fish, Wildlife & Parks

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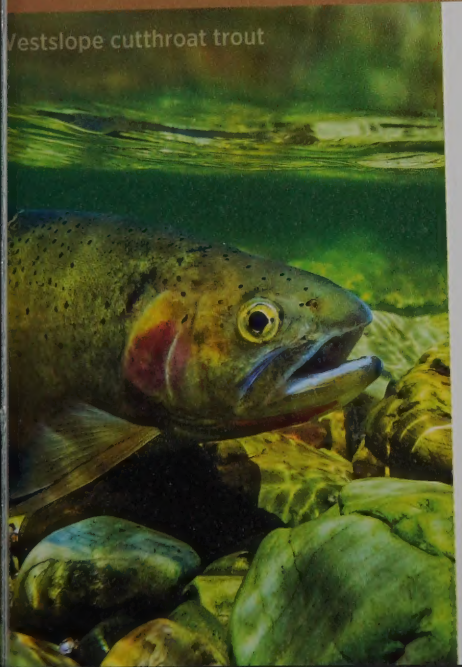

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A CHIP OFF THE OL' BLOCKS

SONJA ANDERSEN
Wildlife Biologist, Lewistown

I'M THE ACORN that didn't fall far from the tree, because both my parents were wildlife biologists.

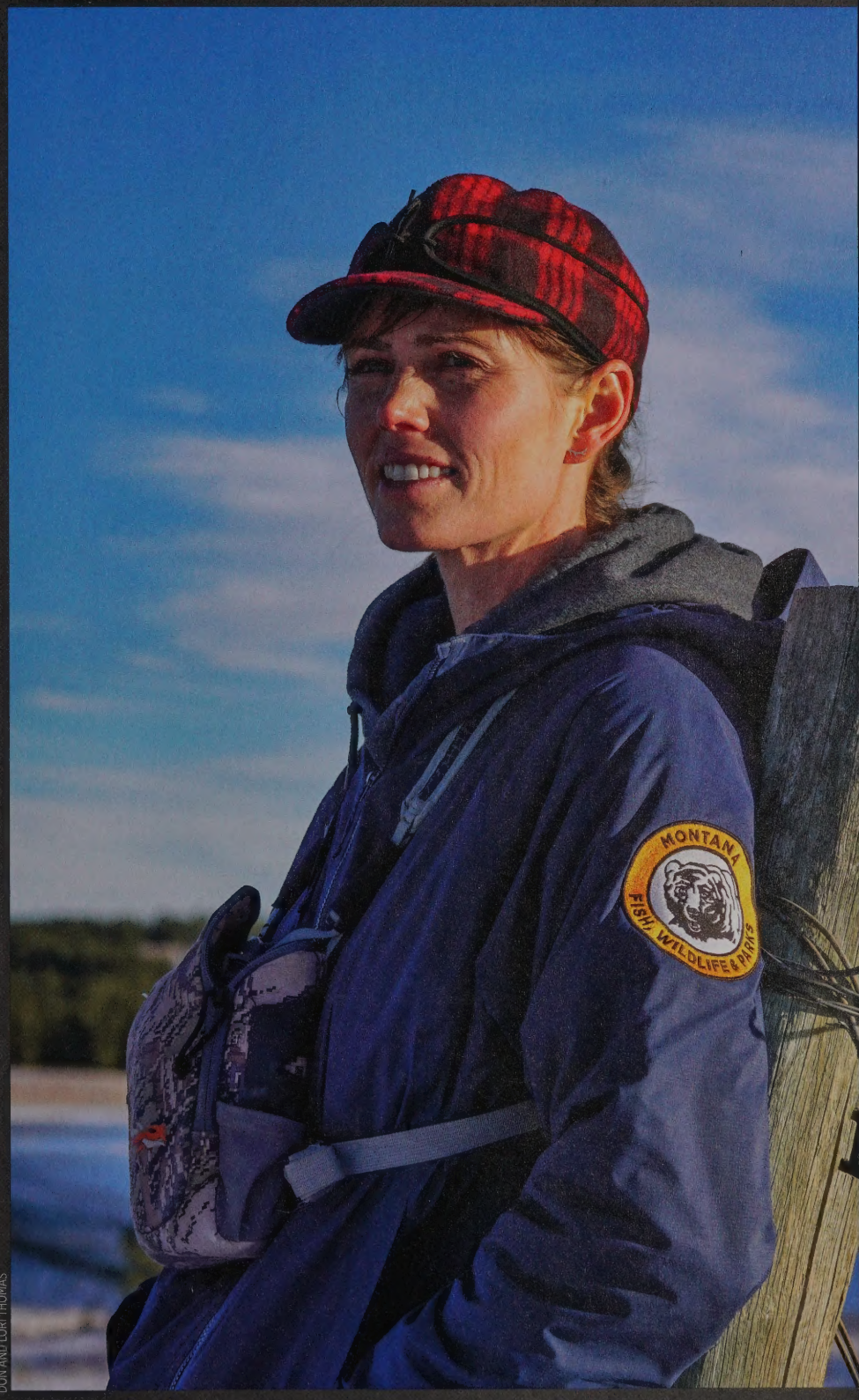
I grew up in the Southwest and attended the University of Arizona in Tucson. Though our family spent a lot of time outdoors, neither of my parents was a serious hunter. I more or less started hunting on my own while I was in college.

After graduation, I moved to Missoula and earned a master's degree from the University of Montana. I began my first job as a wildlife biologist with FWP in 2011, when I moved to Lewistown. There I met Kyle Andersen, a game warden. We got married a few years later.

I'm responsible for all wildlife in the area, although I spend most of my time on big game. From a management perspective, our biggest challenge here is elk. There are so many different stakeholders—landowners, outfitters, and hunters—who often have legitimate opposing opinions. I love working with big game species, especially bighorn sheep. Last winter FWP reintroduced wild sheep from the Missouri Breaks to the Little Belts, and I enjoyed helping with that project.

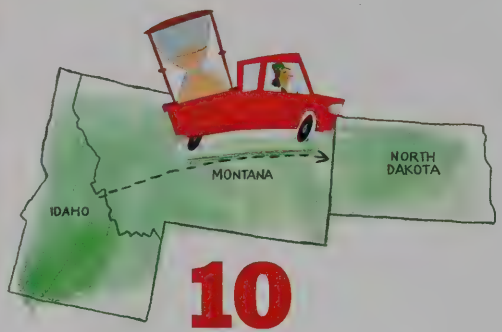
Having both of her parents work for FWP poses some challenges for our four-year-old daughter, Sage. One of us always seems to be busy in the field, but we make it work. Montana is a great place to raise a family.

It's also a great place to hunt big game. I usually don't pay much attention to antlers, and instead try to harvest a cow elk and a whitetail doe for the freezer. But last year I had a chance to shoot a nice mule deer buck in this region. What made the hunt so special was not the big antlers but the long hike back to the truck across miles of prairie with my husband, our backpacks heavy with venison. The experience taught me a lot about the limits of my own endurance.



DON AND LORI THOMAS

Retired riding instructor and dog trainer **Sheila Ruble** spied this garter snake last October while walking up a dirt road to her family's cabin south of Big Timber. "I'm used to seeing terrestrial garter snakes, which are gray and green and not as red as this one," says Ruble, who lives with her husband north of Billings. "I thought it might be something exotic, but when I looked it up, it turned out to be a common garter snake, which sometimes have these bright red side markings. I grabbed three or four shots before it slipped away into the tall grass. I liked this shot best because of the curve of the snake's body and the way the color of the aspen leaves was repeated in the yellow of its back stripe." ■



10

Hours to drive, via I-90/94, across Montana from the Idaho border to the North Dakota border.

New and improved online Hunt Planner map

FWP has added new features to the agency's popular online Hunt Planner map, a free interactive mapping service for researching hunting opportunities in Montana.

The new Hunt Planner has an easier-to-use interface for mobile devices and other improvements, including:

- A harvest-opportunity tool, rather than individual data layers, to display opportunities for species, hunter type, and seasons.
- A search tool to determine where hunting licenses and permits are valid.
- A feature allowing users to find their current location on the map.
- Links to hunting regulations.
- The ability to export and print a geo-referenced PDF map.
- The ability to create a GPX file to upload to GPS devices.
- Better drawing tools.
- Coordinates of cursor location.

Visit the Hunt Planner at myfwpmt.gov/fwpPub/planahunt.

WILDLIFE ENCOUNTERS

Grizzly kills cyclist in Ovando

On July 6, a grizzly bear killed a 65-year-old woman after it pulled her from a tent in a campground in the tiny town of Ovando, between Missoula and Lincoln. Four days later, federal wildlife officials staking out a nearby chicken coop previously raided by the grizzly fatally shot the bear.

The victim, a registered nurse who worked at a California hospital, was an experienced cyclist on a mountain biking trip with two companions. The group was camped behind the Ovando post office when the woman was attacked in her tent at 3:30 a.m.

State and federal wildlife crews set five live traps in and around Ovando to capture the bear.

This grizzly was killed because it was considered a public safety threat due to the predatory nature of the attack.

"Everybody's pretty shaken up right now," Ovando saloon owner Tiffanie Zavarelli told the Associated Press the day after the fatal attack.

Located near the Blackfoot River, Ovando borders a huge expanse of forested lands that stretch to the Canadian border. The region is home to an estimated 1,000 grizzlies.

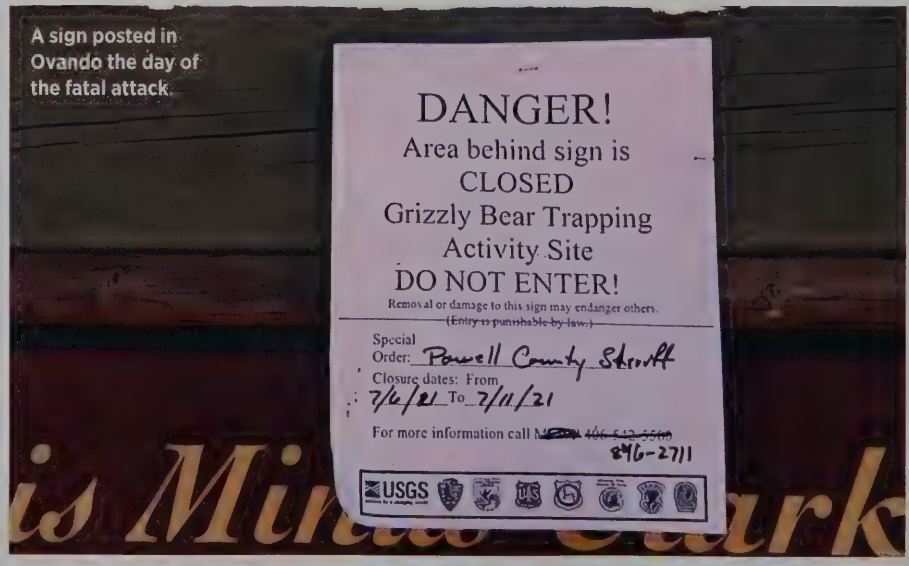
Bear attacks on humans are relatively rare, particularly in inhabited areas. Ovando businesses cater to bicyclists traveling on nearby Montana Highway 200 or the Great Divide Mountain Bike Route. Cyclists are allowed to pitch their tents at a small park in town.

Investigators gathered DNA evidence from the scene of the attack to compare it with samples from the dead grizzly. On July 15, agency officials confirmed that the bear was the same one that killed the cyclist.

Bears that attack people are not always killed if the mauling results from a surprise encounter or a female bear defending its young. But this grizzly was considered a public safety threat due to the predatory nature of the attack.

On average, a grizzly bear fatality in Montana occurs about once every few years. In April 2021, a backcountry guide was killed by a grizzly while fishing near Yellowstone National Park in southwestern Montana. The bear was shot and killed when it charged wildlife officials as they approached the site of the attack.

Before the Ovando incident, the most recent fatal mauling in northern Montana came in 2016. An off-duty U.S. Forest Service law enforcement officer mountain biking in the Flathead National Forest collided with a grizzly and was attacked and killed. ■



A sign posted in Ovando the day of the fatal attack.

CLOCKWISE FROM TOP LEFT: MIKE MORAN ILLUSTRATION; SHUTTERSTOCK; JOHN WARNER; MONTANA FWP; MONTANA FWP

Why are fishing restrictions named for owls?

The summer of 2021 has been unusually hot and dry, with record-breaking temperatures and a worsening drought in many areas. Since late June, FWP has closed fishing on many rivers and streams during the heat of the day. Known as "hoot owl" restrictions, the closures help protect trout from the stress of being caught in waters where flows drop below critical levels or water temperatures increase to dangerous highs.

The "hoot owl" term may have originated from early 20th-century logging operations. In summer, western forests become extremely dry and hot, increasing wildfire potential. Loggers began work before dawn and ended in early afternoon, to avoid operating machinery and engaging in other spark-generating activities during the heat of the day. Because they worked so early, loggers often heard barred or great horned owls hooting. Commonly known as "hoot owls," these species are "crepuscular," meaning they are mainly active at dawn and dusk.

An FWP hoot owl restriction means angling is allowed only from midnight to 2 p.m. To fish a full day, many anglers and guides adjust their outings just as loggers did and often still do, starting at dawn and ending in early afternoon. ■

HUNTER AND LANDOWNER RELATIONS

Block Management celebrates 25 (+1) years

Amid the disruptions caused by the Covid pandemic during 2020, many important milestones went unrecognized. One we missed here at *Montana Outdoors* was last year's 25th anniversary of Fish, Wildlife & Parks' Block Management Program.

Though the popular access program started in a few areas during the mid-1980s, it wasn't until 1995 that the Montana Legislature created the formalized program that hunters and landowners recognize today.

Block Management provides public hunting opportunities on private land across the state and creates working relationships among landowners and hunters. Funding comes from a portion of resident and nonresident base hunting licenses, nonresident upland game bird licenses, nonresident combination deer-elk licenses, and chances sold in the Super-Tag license lottery.

For the 2020 hunting season, more than 1,200 landowners enrolled roughly 7.1 million acres of private and isolated public land in the program.

Jason Kool, FWP Hunting Access Bureau chief, recently tallied hunter use of all block management areas (BMAs) over the past quarter century and came up with a total of nearly 10 million hunter days. "That's a considerable amount of generosity from Montana landowners and significant opportunities for resident and nonresident hunters," he says.

According to Kool, more than 300 landowners have been enrolled in the program since 1995. Last year FWP provided each with a laser-etched sign commemorating their quarter-century partnership with the agency.

One landowner who's been with Block Management since the start is Henry Gordon of Chinook. The Gordon family's lands are included in the North Blaine Block Management Area, which encompasses more than 85,000 acres of public and private land in northern Blaine County.

Gordon says the checkerboard of public and private land confused hunters trying not to trespass. "Putting this property into Block Management made it easier for them to get around," he says. "Plus, we were worried about hunters starting and leaving campfires and not having anyone out there to keep watch. It's good to have wardens and seasonal Block Management technicians who patrol and help enforce the rules."

Henry Gordon and his daughter, Trisha G. Gruszie, who manages the Gordon Cattle Company. The family ranch in northern Blaine County is one of more than 300 statewide enrolled in Block Management since the program formally began in 1995.

Gordon notes that while a few knuckleheads show up each year, most hunters obey the BMA rules and regulations. "One time, a guy left $100 and an apology note in the sign-in box saying it was to help fix a fence post that he broke," Gordon says. "That was pretty neat, and I appreciated it."

Former Montana Fish and Wildlife commissioner Richard Stuker, whose property is also enrolled in the North Blaine BMA, says most hunters act as extra eyes and ears to help enforce rules and regulations. When they see misbehavior, "they will tell me or FWP," he says. "They know it's a privilege to hunt on my private property, not a right." ■

FWP VIDEO SHOWCASE

A sample of seasonal videos produced by FWP staff throughout Montana for social media and television.

Controlled burn
Why FWP set portions of a wildlife management area on fire, and how these and other "controlled burns" help vegetation and wildlife.

youtube.com/watch?v=icsTTJLzLZw

What we do at FWP
A look at the work that biologists, technicians, and others do to manage the resources entrusted in the agency's care.

youtube.com/watch?v=sTeUdIt6nNw

Antlers or horns?
It's easy to get confused. And even once you think you understand the difference, along come those crazy pronghorn.

youtube.com/watch?v=2amWvHu0H5w

The copper option
For the good of golden eagles and other scavenging raptors, hunters might consider switching to nontoxic bullets when hunting this fall.

youtu.be/9zaZwwCOcY4

A warden's life
A look at the rewarding and challenging 40-year career of Seeley Lake–area FWP game warden Bill Koppen, who retired in 2019.

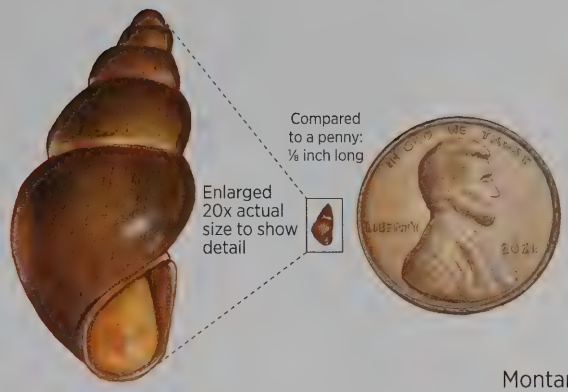
youtu.be/7y2Sa3-vkMo

Warm waters
In late summer, trout waters can reach temperatures too warm for trout and other salmonids. Here's how FWP and anglers are helping.

youtu.be/SqZ5vFa-wnU

New Zealand Mudsnail

Potamopyrgus antipodarum



What they are

These are tiny aquatic snails, originally from New Zealand, that range in size from a grain of rice to 1 inch long.

Where they are

In Montana, these minuscule snails now live in most major trout rivers east of the Continental Divide, as well as in Yellowstone National Park. Recently they were also found at Spring Meadow Lake in Helena.

How they spread

Too small to be noticed by most anglers and boaters, New Zealand mudsnails move from one waterbody to another in mud attached to boats, waders, wading boots, and other fishing gear. The gastropods can live for 24 hours without water, and for up to 50 days on damp surfaces. Female mudsnails are self-reproducing and are born with developing embryos inside them, meaning that a single mudsnail can establish an entire new colony.

Why we hate them

New Zealand mudsnails consume vast amounts of algae needed by native mayflies, caddis flies, and other aquatic invertebrates. In Yellowstone National Park rivers, researchers from Montana State University reported densities of up to 850,000 mudsnails per square meter.

New Zealand mudsnails provide no nutritional value for fish or birds. By closing a "trap door" in their shell opening, they pass through other animals' digestive tracts unharmed.

How to get rid of them

It's tough. These invasive snails first showed up in the Madison River in 1995. Once colonies become established in a stream, removing them is not feasible. The first line of defense is preventing them from spreading in the first place. That's why FWP urges anglers to clean, drain, and dry all equipment after each use, especially after visiting infested waters. If you see what looks like a New Zealand mudsnail, report it at CleanDrainDryMT.com. ■

Illustration by Liz Bradford

THE MICRO MANAGER

A quick look at a concept or term commonly used in fisheries, wildlife, or state parks management.

"Recruitment"

Recruitment is a concept in wildlife management that refers to the number of baby elk, deer, moose, and other animals that survive to adulthood (breeding age), which for most species is one year old.

Recruitment largely determines whether a population grows or declines during a given year. If recruitment is high—for instance, when lots of elk calves and deer fawns are born and survive their first year, thus "recruiting" into the adult population—a population will usually increase (if adult mortality remains unchanged). But if recruitment is low (with steady adult mortality), a population will usually decrease.

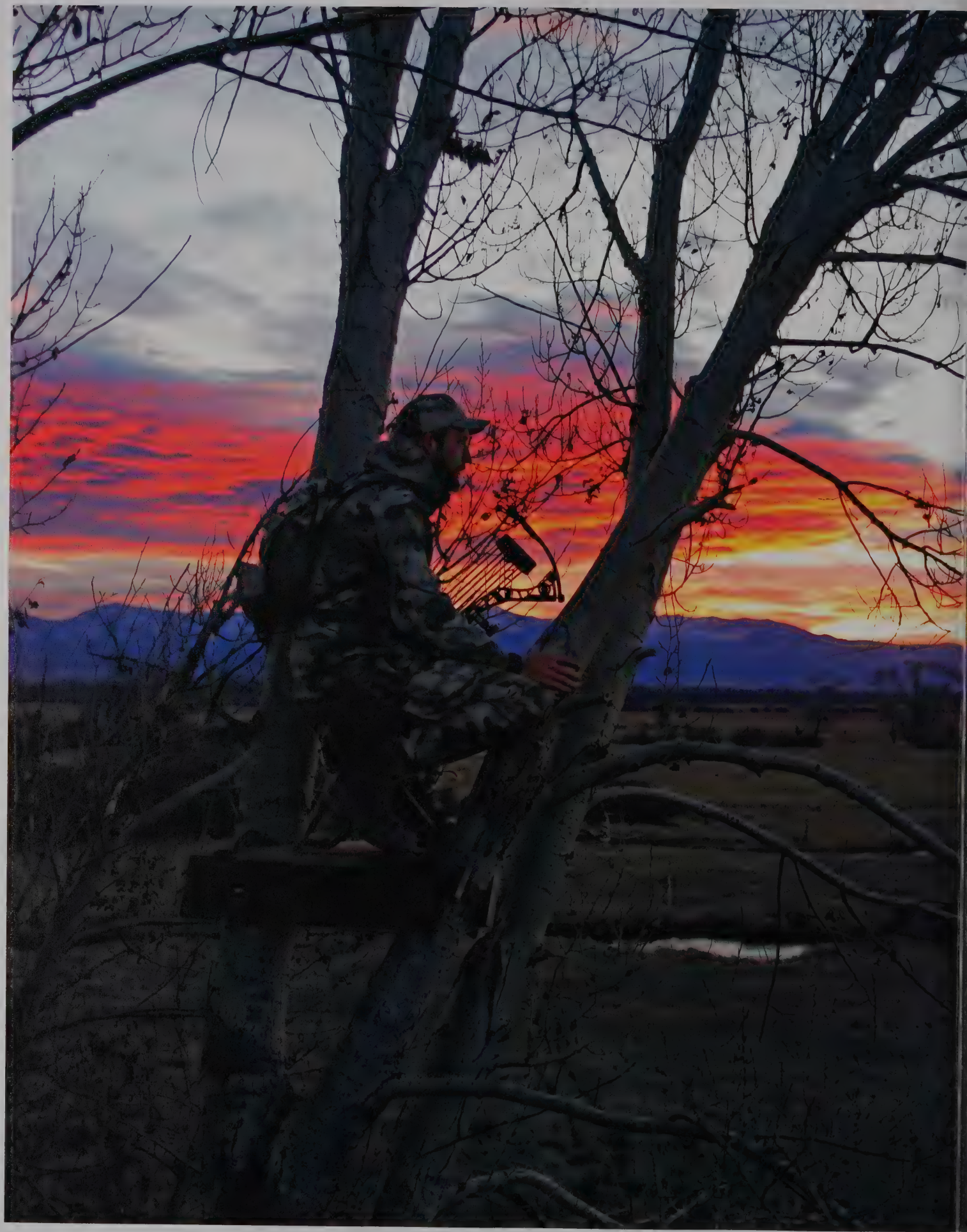
During their first year, and especially their first winter, young big game animals are particularly vulnerable to dying from starvation, predation, or disease. But once they make it past that first year, survival greatly improves, as does their chance to breed and contribute to future population numbers. This key life-stage milestone is when wildlife biologists consider young deer and elk as part of populations.

Many things affect recruitment rates, which with elk are measured each spring by the number of calves per 100 cow elk (such as 10:100, a low recruitment rate, or 40:100, a high rate). These include whether a cow even becomes pregnant in the fall, the condition of a pregnant cow during winter and spring (which affects the health of the newborn calf), the number of predators in an area, and the harshness of the calf's first winter.

A cow helps her newborn calf stand. If this young elk survives its first winter, biologists consider it to have "recruited" into the population.

CINDY GOEDDEL

FWP biologists can't control weather, but they can help improve recruitment rates—if the goal is to increase a population—by protecting and improving elk summer habitat and winter range and, if necessary, reducing predator numbers. ■



PLAYING THE SHORT GAME A bowhunter waits for whitetails at dawn at a weapons restriction area in the Gallatin Valley. WRAs provide great hunting opportunities in areas near buildings or highways where rifles would be too dangerous.

DENVER BRYAN

SHORT-RANGE OPTIONS *for* BIG GAME HUNTS

Weapons restriction areas provide opportunities for hunters who don't need to take the long shot.

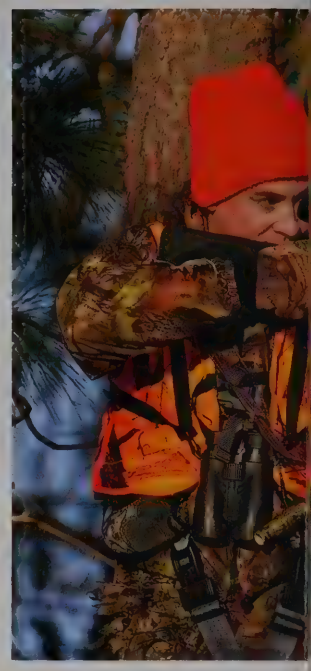
BY JACK BALLARD

The housing boom in eastern Gallatin Valley around Belgrade and Bozeman has gobbled up thousands of acres of undeveloped land in the past decade. Even so, abundant deer, elk, and black bear habitat remains, including a massive area open to big game hunting.

But you can't use a regular rifle there. The 109,341-acre (170-square-mile) Gallatin Valley Weapons Restriction Area (WRA) limits big game hunting to weapons that have reduced shooting range and less possibility a stray shot might damage property or injure livestock or people.

Across Montana, 16 other WRAs also are open to big game hunting under special weapons restrictions. WRAs are public lands, often but not always managed by Montana Fish, Wildlife & Parks, where houses, roads, farms, and other developments are too close for regular-rifle use. Some are open to archery hunting only, but most also allow other limited-range weapons, including shotguns, muzzleloaders, and traditional handguns. These firearms have a shorter lethal range (generally less than 100 yards) than centerfire rifles and thus are considered safer (though not necessarily safe) in areas where people live and travel.

Taking advantage of these little-known hunting hot spots requires a basic understanding of how the various allowable firearms function, proficiency with your firearm of choice, and the skill to sneak close enough to an animal to make a lethal shot. ▸▸



SAFER OPTIONS Technological improvements make compound bows (above left) and muzzleloader rifles (above right) increasingly more accurate out to ever-greater distances (up to 50 and 100-plus yards, respectively). But both are still far less dangerous around buildings and roads than a regular deer or elk rifle, which can send a bullet a mile or more.

BOWS

Any bow legal for archery hunting in Montana may be used on a WRA. Crossbows are legal only in certain WRAs and only during the general rifle season (not during the general archery-only season).

SHOTGUNS

Hunters who already own a shotgun used for waterfowl or upland birds can use that same firearm to hunt big game on WRAs. For some popular shotgun models, such as the Remington 870 or Mossberg 500, there's also the option of buying a special rifled barrel for big game hunting. Or you can purchase a special shotgun already fitted with a rifled barrel. All versions fire a slug, a thumb-size lead or copper bullet that sits in the plastic casing of a shotgun shell.

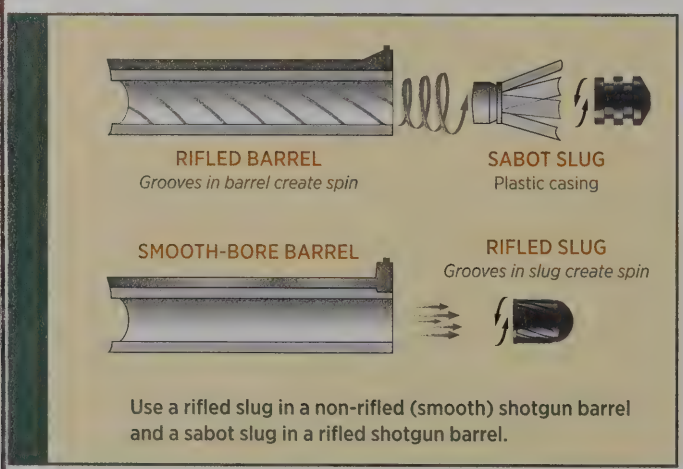
If using a smooth-bore shotgun barrel, you'll need what's known as a rifled or Foster slug. Angled grooves in this slug cause it to spin as it exits the barrel. When using rifled slugs, your choke must be no tighter than "modified." If you have screw-in chokes, keep a choke screwed tight so the slug doesn't damage the exposed threading. And always follow the shotgun manufacturer's recommendations for slug use from a smooth-bore barrel.

A rifled shotgun barrel has spiraling grooves ("rifling") cut into it like those in a rifle barrel. For a rifled shotgun barrel, you shoot what's known as a sabot (*SAY-bow*) slug, in which the projectile sits in a plastic casing that spins in the grooved barrel. When the casing exits the muzzle, it releases the slug, which also is spinning and thus travels with increased speed and velocity (like a spiral-thrown football).

Which is better? For close range (less than 50 yards), both are sufficiently accurate and have roughly the same velocity and knockdown power. At 50 to 100 yards, a sabot slug in a rifled barrel is more accurate. Because of their heavy weight and low velocity, shotgun slugs of any type generally don't provide reliable accuracy beyond 100 yards.

Note that some brands of rifled slugs work better than others. Test a few varieties to find which one works best for your gun.

Most WRAs also allow use of heavy shotgun "buckshot"— six to eight large pea-size BBs encased in a shotgun shell. FWP recommends using no smaller than #00 Buck in 12-gauge or 10-gauge and only at 40 yards or less.



Use a rifled slug in a non-rifled (smooth) shotgun barrel and a sabot slug in a rifled shotgun barrel.

Shotguns fire a slug, a thumb-size lead or copper bullet that sits in the plastic casing of a shotgun shell.

MUZZLELOADERS

The difference between a modern deer or elk rifle and a muzzleloader rifle is that the modern gun shoots a cartridge in which the projectile (bullet) and gunpowder are combined in a metal "case" that gets loaded in the "breech," the opening above and slightly in front of the trigger. With muzzleloaders, the powder and projectile are separate. Gunpowder is poured into the barrel muzzle (end) followed by the projectile, which is then tapped down with a long rod. When the shooter fires a muzzleloader, a metal "striker" hits an ignition "cap" in the breech that ignites the powder.

Both muzzleloaders and modern rifles have "rifled" barrels that cause the bullet to spin and thus fly farther and more accurately.

Because they have a shorter lethal range than that of centerfire rifles, muzzleloaders are considered less dangerous in areas near where people live and travel.

Muzzleloaders used on WRAs have various restrictions. They must be a minimum of .45 caliber; use plain lead projectiles (sabots not allowed); be loaded with black powder, pyrodex, or an equivalent; and be incapable of being loaded from the breech

Jack Ballard is a writer in Red Lodge.

HOW TO FIND WRAS IN MONTANA

To locate WRAs, visit the online FWP Hunt Planner at fwp.mt.gov/gis/maps/huntPlanner (or scan the QR code below). Click the "Big Game Restricted Areas" box, then click on the hunting districts (in red) on the map. Then open your FWP hunting regulations booklet to those hunting districts to see specific restrictions. Some privately owned lands, state school trust lands, and fishing access sites may have further restrictions, such as archery-only, no-weapon, or no-shooting designations. WRA restrictions and areas are also listed on pages 25–28 of the 2021 regulations booklet. To find out which FWP fishing access sites allow hunting (most do) and their weapons restrictions, visit myfwp.mt.gov/fishMT/explore or scan the QR code below right.

FWP Hunt Planner

Fishing Access Sites

(see FWP hunting regulations for a full list of restrictions).

Muzzleloaders are very capable firearms for taking big game. One season, I harvested a bull elk, a buck deer, and a buck antelope in Montana, all with a budget .50 caliber muzzleloader. You can buy a basic muzzleloader setup including a budget rifle and necessary accessories for less than $400, making it an affordable option for most hunters.

A modern muzzleloader is more accurate and provides more range than a shotgun that shoots slugs, even those with rifled barrels. Though the process for loading a muzzleloader is more complex than simply sticking a shell into a shotgun, it's easy to learn with a little practice. Also, with a muzzleloader you only get a single shot at an animal, requiring both competence and self-discipline.

Montana has never held a special muzzleloader season, but as this issue went to press, the state had proposed, subject to Fish and Wildlife Commission approval in September, a traditional-muzzleloader-only season that would run December 11–19, 2021. Hunters could use any license or permit that was valid for deer or elk during the general big game season. Visit the FWP website at fwp.mt.gov in September for updates and details.

HANDGUNS

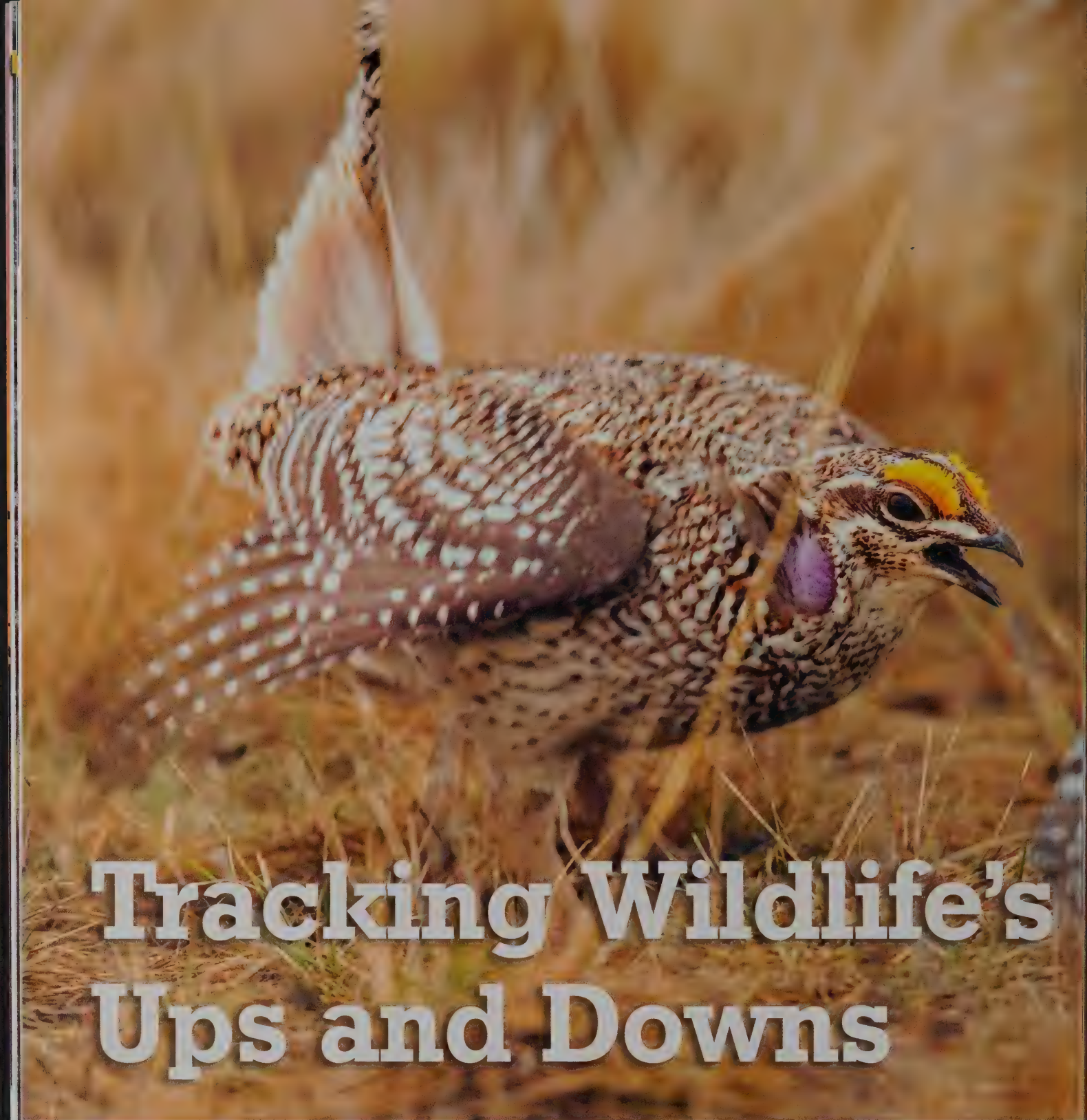
Traditional handguns also are legal where firearms are allowed on WRAs. Don't get confused about the "traditional" part. Modern semi-automatic handguns are just as legal as Old West–type revolvers. What aren't allowed are long-barreled "nontraditional" handguns. On WRAs, a handgun's barrel length can't exceed 10.5 inches, nor can the handgun be shoulder mounted. It also must fire only a "straight-walled" cartridge not originally developed for rifles.

For hunting, experts recommend handguns with barrels 6 inches or longer to improve muzzle velocity and accuracy. The various .357 Magnum cartridges are generally considered the minimum for deer and black bears and the .44 Remington Magnum for elk. For big game hunting, use the heavier handgun bullets designed for penetration rather than the rapidly expanding ones used for personal defense.

Whether firing a shotgun, muzzleloader, or handgun, don't shoot at big game at distances beyond what gives you a high-percentage shot. Practice beforehand. Then limit your shots to distances at which you can consistently put five rounds into an 8-inch target from standing, sitting, kneeling, and prone shooting positions. For hunters accustomed to killing big game from 200 yards or farther with a regular rifle, passing up shots at those distances on WRAs requires self-restraint.

Learning to sneak close to a big game animal is difficult. But it's worth the effort for the extra hunting opportunities that Montana's many WRAs provide.

SHORT SHOT The author with a whitetail buck taken at about 80 yards with his scope-mounted .460 Smith & Wesson. "It's not a tool for the recoil shy," he says.



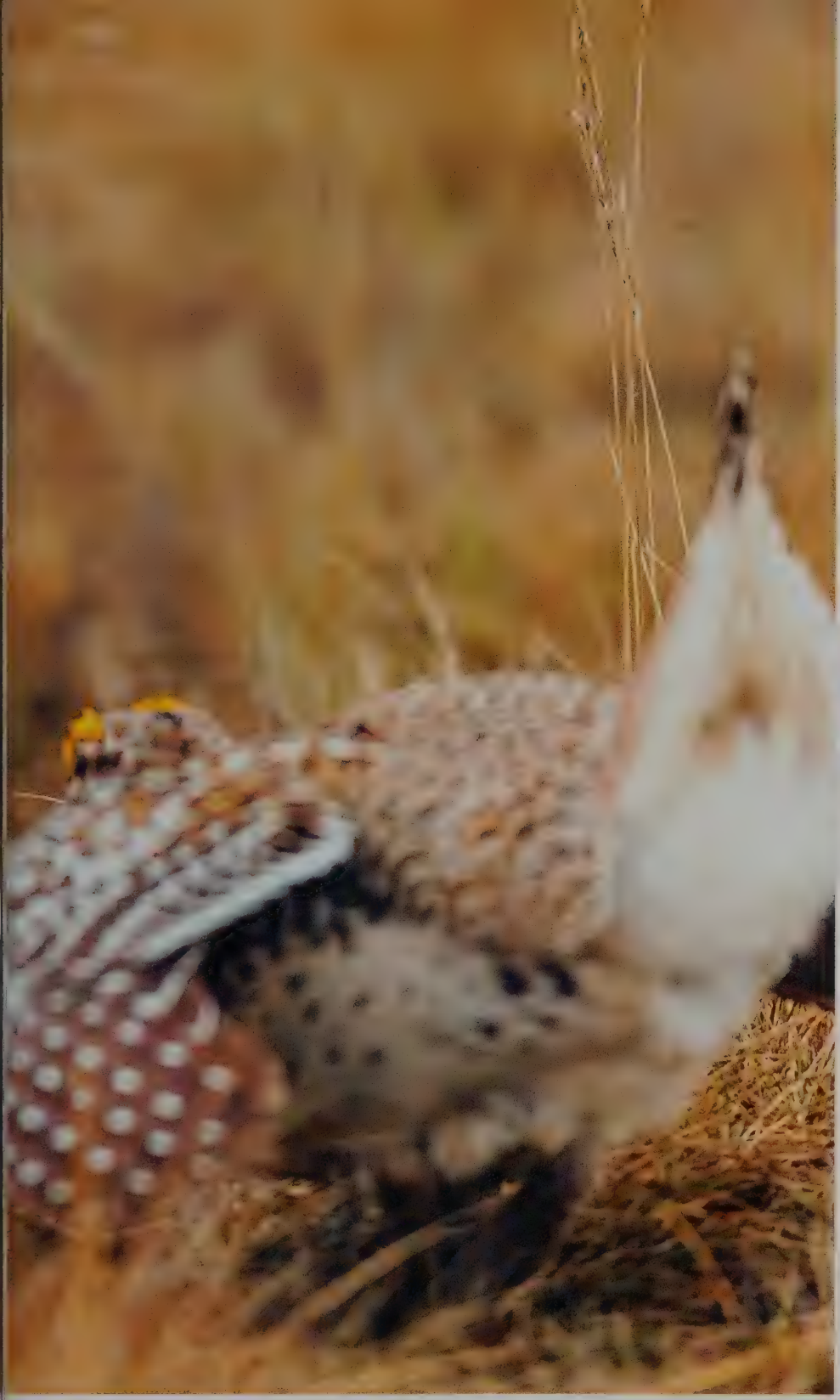
Tracking Wildlife's Ups and Downs

What FWP biologists learn when they monitor populations and individual animals.

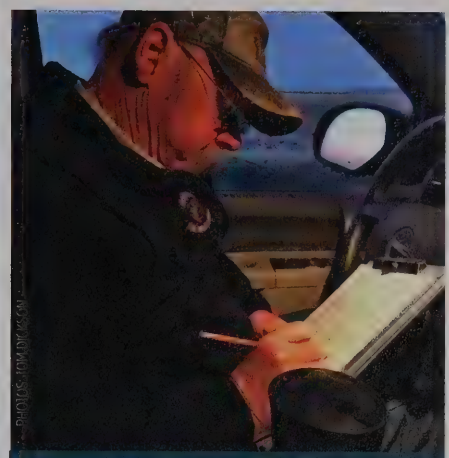
By Tom Dickson

"Listen."

Ryan Rauscher leans out his pickup window and tilts his head. It's a half hour before sunup in late April, about 15 miles east of the Rocky Mountain Front near the tiny town of Bynum. Rauscher, the FWP wildlife biologist in Conrad, has driven through darkness



STEVE MITCHELL



LOOKING AT LEKS In the early morning light, Conrad-area FWP wildlife biologist Ryan Rauscher tallies male sharp-tailed grouse seen on a nearby lek. Below: Later he scans another lek for dancing grouse, which perform their mating ritual at the site each spring.

across private land, with permission, to monitor a sharp-tailed grouse "lek." On these open areas amid sagebrush and short-grass prairie, males and some females gather at dawn each spring for the prairie birds' lively mating ritual.

At first the only sound I discern is a flying snipe's eerie winnowing. Then I hear it: the staccato chittering of dancing sharp-tailed grouse males. Rauscher leans farther out the window, binoculars trained on the distant commotion. "One, five, eleven...sixteen males, and two hens," he says after a few minutes of watching.

I squint, unable to see a thing in the predawn gray. Finally the white triangles of the male birds' tails appear, 100 yards off, poking up from yucca and grasses.

Before heading for several other leks scattered across the county, we stay a bit longer, watching these birds perform a mating rite that has taken place here every spring for tens of thousands of years.

Sharp-tailed grouse lek counts are among the dozens of wildlife surveys that FWP biologists and other scientists conduct across Montana each year. The surveys range from calculating the size of vast elk and deer herds to tracking individual grizzly bears and pronghorn fawns.

This monitoring is essential. The Montana Legislature requires FWP to manage all of the state's 500-plus wildlife species, especially game animals pursued for meat or fur and those with declining numbers that, if not effectively conserved, could end up under federal protection. Wildlife "management"—making sure healthy populations stay healthy, reducing numbers of species causing problems (like eating too much hay on ranches), and restoring struggling populations—requires making decisions based on

“We have to know how wildlife populations are trending, whether up or down.”

reliable information. “We have to know how populations are trending, whether up or down,” says Justin Gude, chief of the FWP Wildlife Research and Technical Services Bureau. Without that information, wildlife managers couldn’t recommend effective hunting seasons, conserve habitat, or keep species off the federal endangered species list. “Stop monitoring populations and you basically stop managing wildlife,” Gude says.

THOROUGH SEARCH An aerial survey track log for elk shows the routes an FWP pilot and a wildlife biologist fly each winter along a western Montana mountain range in search of bulls, cows, and calves.

MANY METHODS

As any hunter or bird watcher knows, finding animals, especially in forests, is often impossible. Most wild animals are by nature secretive and well camouflaged. That requires a wide range of techniques to find, track, and count them.

For big game animals like elk, mule deer, and pronghorn, biologists fly in two-seater helicopters or airplanes flown by FWP pilots, tabulating what they see below, following the same transects each winter and early spring. Biologists count ring-necked pheasants by tallying rooster crows at dawn in early May along roadside routes. Like sharptails, sage-grouse are counted when gathered on their springtime leks. Waterfowl numbers are estimated by the U.S. Fish and Wildlife Service in cooperation with Montana and other states based on counting breeding ponds in May and broods in midsummer. To count wolverines and grizzlies, two species that live mostly in remote wilderness, scientists use trail cameras or analyze DNA from hairs snagged on barbed wire surrounding smelly lures.

Biologists also trap individual bears, elk, deer, and other wildlife and fit them with GPS collars to map where the animals go—information vital for understanding habitat needs and migration routes. For instance, biologists have tracked elk leaving Yellowstone National Park to the security of private ranchlands in the Madison Valley in southwestern Montana 60 miles away. They’ve also fitted newborn elk with collars that emit a special signal if the animals die, allowing biologists to race to mortality sites to see what killed the calves.

Using increasingly sophisticated technology, FWP biologists have been keeping tabs on wildlife since the agency’s first inventory

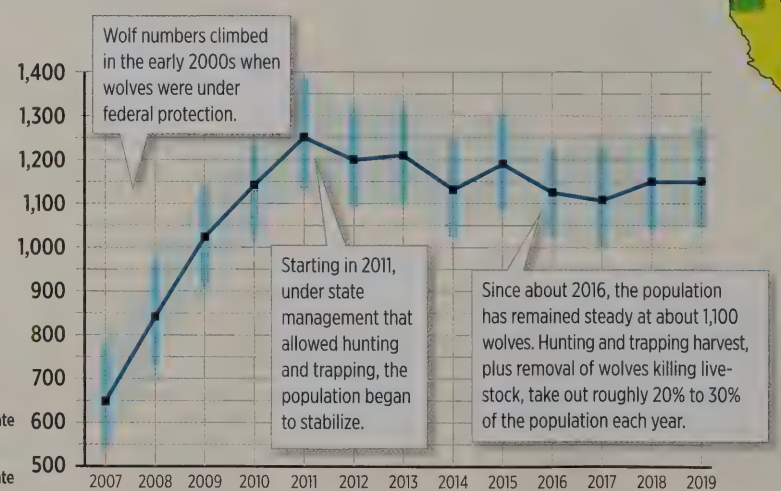
Tom Dickson is the editor of Montana Outdoors.

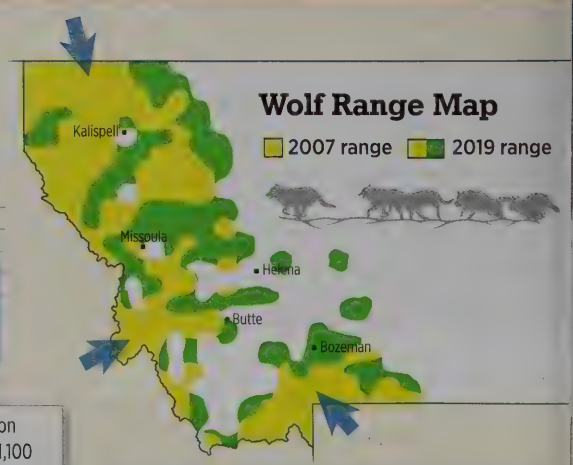
CLOCKWISE FROM TOP LEFT: MONTANA FWP; PAUL N. QUENEAU; MONTANA FWP; TONY BYNUM; RION SANDERS; MONTANA FWP; TONY BYNUM; STEVE MCMORRAN

MONITORING IN ACTION: Using population data to manage Montana’s wildlife

The graph below shows the **estimated wolf population in Montana** from 2007 to 2019 (latest data). Counts are based on wolf sightings by deer and elk hunters each fall—information gathered from FWP’s winter hunter harvest phone surveys. This data is combined with analyses of pack and territory sizes to estimate Montana’s wolf population.

Montana wolf population
2007–2019


Wolf numbers climbed in the early 2000s when wolves were under federal protection.
Starting in 2011, under state management that allowed hunting and trapping, the population began to stabilize.
Since about 2016, the population has remained steady at about 1,100 wolves. Hunting and trapping harvest, plus removal of wolves killing livestock, take out roughly 20% to 30% of the population each year.
1,400
1,300
1,200
1,100
1,000
900
800
700
600
500
2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
Upper population estimate
Estimated wolf count
Lower population estimate



This map shows widening wolf distribution from 2007 to 2019. Montana’s wolves are descendants of packs that began moving south from Canada in the late 1980s, and reintroduced packs spreading east from Idaho and north from Yellowstone National Park starting in the late 1990s.

MONITORING TOOLS AND TECHNIQUES Above: An FWP airplane flies low over the Gallatin Range in winter as the pilot and biologist inside search for elk. Clockwise from below left: Using scent attractants surrounded by brass bristle brushes to collect the hair of elusive wolverines for DNA analysis and population monitoring; taking DNA samples of a sedated black bear cub; releasing a cow elk with a tracking collar; checking a trail camera for images of fishers; counting bats in a remote cave; using radiotelemetry to locate the whereabouts of radio-collared mule deer.

> "Few people see deer and elk more regularly than ranchers out checking their herds or fixing fences."

in 1941. That year Bob Cooney, head of the then-new Wildlife Restoration Division, led a six-person crew that crossed the state on foot, snowshoe, and horseback. The men counted every elk, deer, mountain goat, pheasant, goose, and other wild animals they observed, binoculars in one hand and notebook in the other.

ONLY WHAT THEY COULD SEE Wildlife monitoring has grown far more accurate and valuable to managers over the past 80 years. Montana's first surveys were conducted in 1941, when a handful of biologists hiked, rode, and drove across the state, counting animals as they went. Shown here is biologist Merle Rognrud searching for mountain goats on Switchback Pass in 1946 in what later became the Bob Marshall Wilderness.

MERLE ROGNRUD PHOTO COLLECTION, MONTANA'S MILITARY LEGACY

GETTING QUOTAS "JUST RIGHT"

As was true then, most wildlife tracking these days is used to help biologists figure out annual hunting season harvest numbers, or quotas. FWP biologists survey elk, deer, and other big game populations, estimate harvest from the previous year, then use all that information to present seasons and harvest levels to the Montana Fish and Wildlife Commission for consideration.

The main goal of deer and elk harvest regulations is to prevent population extremes. Underharvested herds end up with too many deer or elk overbrowsing or overgrazing their habitat, hindering native plant growth and leading to starvation and death. The hungry wildlife also eat hay bales, pasture, and crops.

But overharvest a herd and you immediately create a stunted population that denies people opportunities to see or hunt big game.

To get harvest quotas "just right," biologists need detailed and accurate information. Otherwise they have to be extra conservative with their harvest quota recommendations, says Brian Wakeling, chief of the FWP Wildlife Management Bureau. "We can't risk taking too many does or cows, which could set a population back for years."

Because it's impossible to count every animal, biologists use different scientific methods to get a fix on populations. Rather than determine the exact size of populations (which is not even necessary), they estimate population trends—upward, downward, or stable.

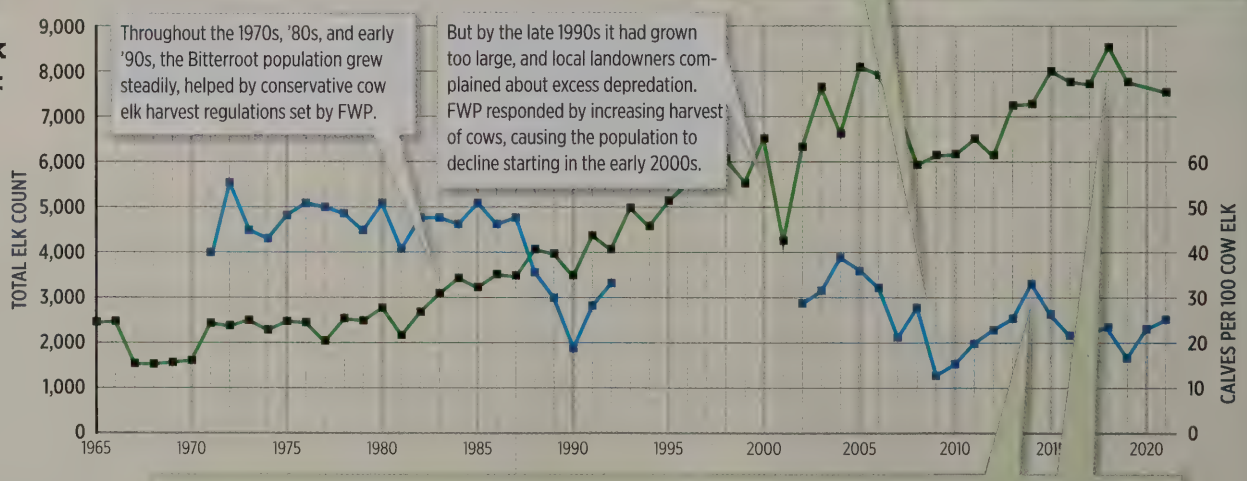
For instance, biologists count the number of mule deer bucks, does, fawns seen from the air in each of 101 "survey areas"

MONITORING IN ACTION: Using population data to manage Montana's wildlife

Bitterroot elk population & recruitment

1965–2021

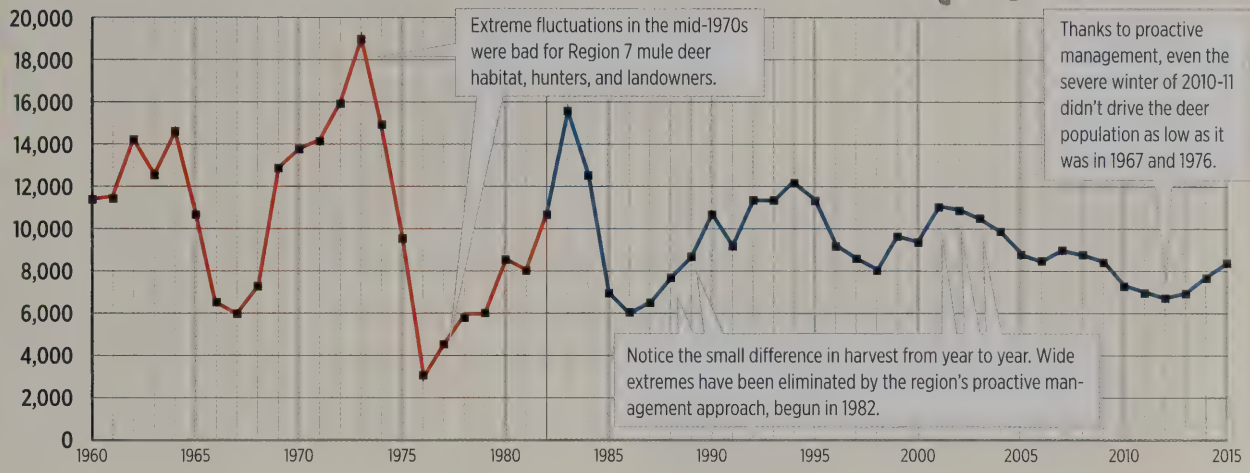
This graph shows the total elk count for seven **Bitterroot hunting districts** since 1965 as well as elk "recruitment" (young elk that survive to age 1, measured by the ratio of calves to cows seen by aerial observers early each spring).



...But to find out for sure, FWP instituted a study that found it was mainly mountain lions, whose numbers had been increasing as well, that were eating the calves. FWP responded by increasing the harvest quota on lions, which then resulted in fewer lions and greater elk recruitment in recent years. The agency also reduced the cow elk harvest, which also has helped the population rebound.

The graph below, based on harvest data gathered over the past several decades, shows **FWP Region 7 mule deer populations** fluctuating widely in the 1960s and '70s. That occurred because FWP increased antlerless harvest too late to prevent overabundant deer from eating themselves out of house and home. The southeastern Montana region switched from this "reactive" management approach to a "proactive" strategy in 1982. By increasing doe harvest *before* deer numbers get too high, FWP has ironed out population extremes, benefiting habitat, landowners, and hunters.

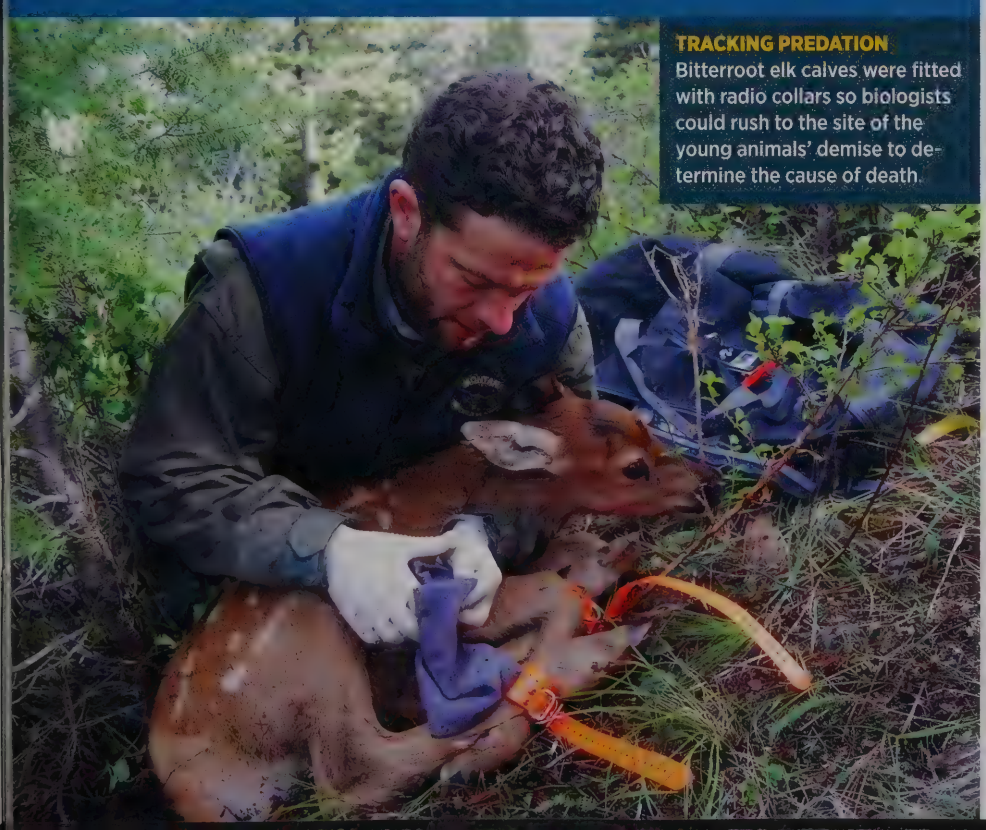
Region 7
Mule deer buck harvest
1960–2015



every winter from December 1 to January 15, when the animals are visible against the snow. The survey areas represent the most common mule deer habitats in each of FWP's seven regions and provide a representative sample. The same routes are flown again from March 15 to April 30, when deer concentrate in open areas during spring "green-up," to see how well both fawns and adults survived the winter.

To keep tabs on elk, biologists count bulls, cows, and calves each year between January and April, on days when snow cover is widespread and skies are clear along established routes over most of Montana's 162 elk hunting districts. Counts of young elk (measured as the number of calves seen per 100 cows) are especially important, because that's how biologists know if reproduction is exceeding or falling behind adult mortality, indicating a growing or declining population.

Another way biologists get a sense of what's going on with local populations is by talking to landowners about the wildlife they see on their property, and by monitoring and addressing depredation complaints. "Few people see deer and elk more regularly than ranchers out checking their herds or fixing fences," Gude says.



TRACKING PREDATION
Bitterroot elk calves were fitted with radio collars so biologists could rush to the site of the young animals' demise to determine the cause of death.

MONTANA FWP

HOW HUNTERS HELP

Yet another piece of the population puzzle is hunter harvest information gleaned from FWP's fall check stations and winter phone surveys. At the roughly one-dozen check stations across the state, hunters must stop and report their success. This provides biologists with "real-time" information during the hunting season, which they check against forecasts made earlier in the year.

Winter phone surveys are done by temporary, part-time FWP employees who interview nearly 100,000 hunters each year, about 60 percent of the total. Surveyors ask where hunters hunted and how they did. They also inquire if hunters saw any wolves or moose. Scientists have learned that sightings by deer and elk hunters are an effective way to track those especially hard-to-detect forest carnivores.

I sat in on several phone surveys this past

"This might be the only personal interaction they have with FWP, so I want it to be as positive as possible."

January at an FWP office in Helena, listening as Amber Feddes called hunters from across Montana and the United States.

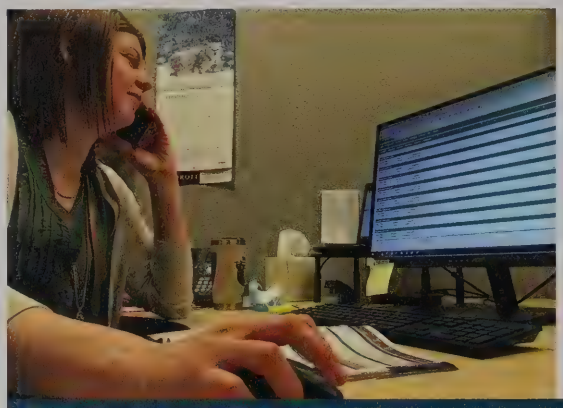
"Hello, Darryl? My name is Amber and I'm calling from Montana Fish, Wildlife & Parks hoping to get some harvest information," she said on a call to a hunter in Miles City. "Do you mind answering a few questions about your season?"

Feddes supervises 47 callers—mostly college students and retirees—working statewide who phone hunters selected randomly by a computer for a cross section of harvest results. Phone surveys typically begin in December and last through February.

"Let's start with deer," Feddes continues. "Did you have a chance to hunt deer? You did? Did you get any? Hey, that's great. A buck? Wonderful. How many points on each antler? Four by four? Good for you. Now, can you remember what hunting district you harvested the deer in?"

Though friendly, Feddes doesn't have time for idle chit-chat. She aims to reach at least a dozen additional hunters this evening. "But if they have a question that I feel I can answer, I try to take the time to do that, or I direct them to the person who can," she tells me. "This might be the only personal interaction they have with FWP, so I want it to be as positive as possible."

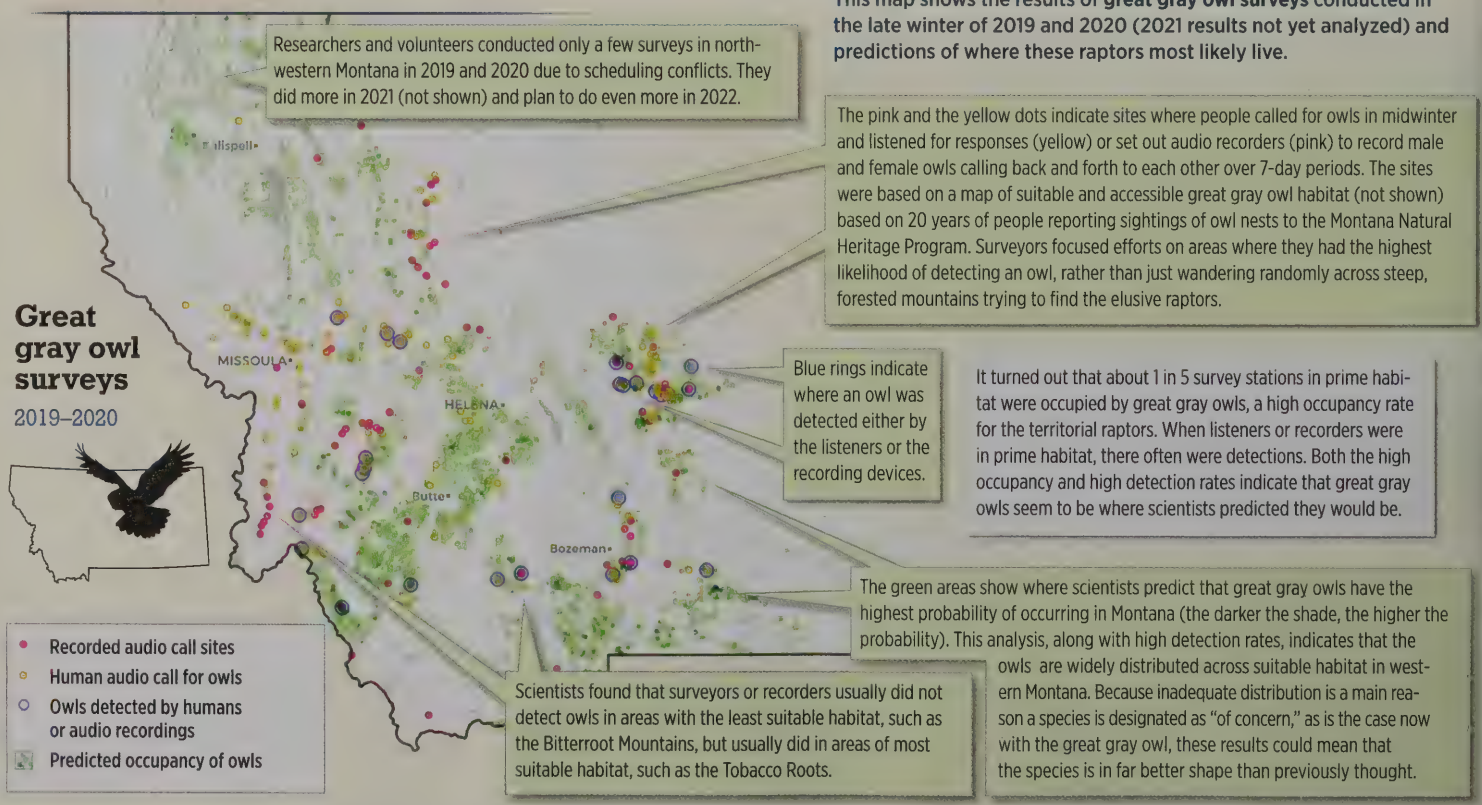
According to Gude, harvest information usually corresponds closely with what biologists saw earlier in the year from the air. Not always, though. For instance, some years hunters harvest more animals than expected, requiring scientists to figure out why. "Maybe we undercounted elk that spring, or weather conditions made it easier for hunters to find elk. Or it could be there's some other factor we don't even know about," he says.



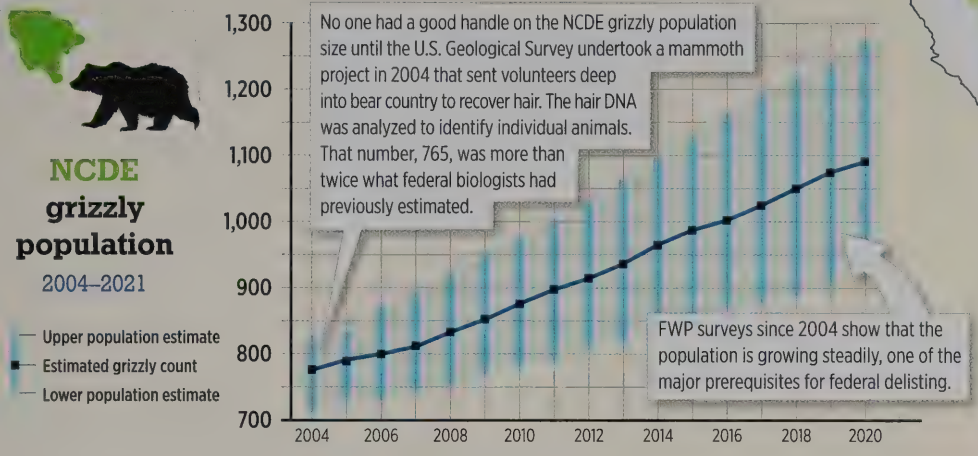
"HOW DID YOU DO?" Some of FWP's most valuable wildlife population information comes from hunter harvest surveys conducted by phone each winter by a team of callers. Shown here is harvest survey coordinator Amber Feddes interviewing a Miles City hunter about his 2020 mule deer hunt.

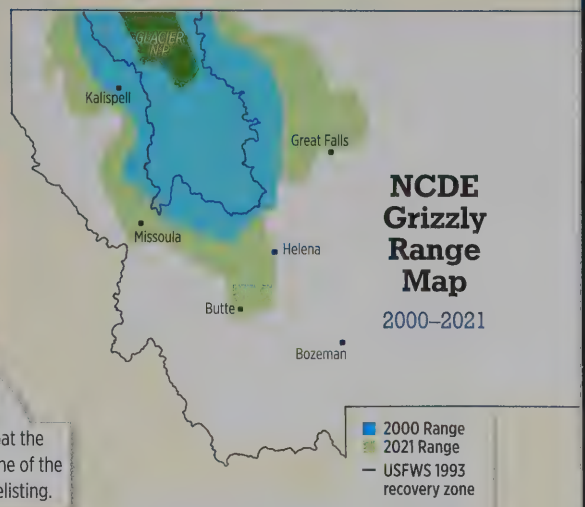
MONITORING IN ACTION: Using population data to manage Montana's wildlife

This map shows the results of great gray owl surveys conducted in the late winter of 2019 and 2020 (2021 results not yet analyzed) and predictions of where these raptors most likely live.


Researchers and volunteers conducted only a few surveys in northwestern Montana in 2019 and 2020 due to scheduling conflicts. They did more in 2021 (not shown) and plan to do even more in 2022.
The pink and the yellow dots indicate sites where people called for owls in midwinter and listened for responses (yellow) or set out audio recorders (pink) to record male and female owls calling back and forth to each other over 7-day periods. The sites were based on a map of suitable and accessible great gray owl habitat (not shown) based on 20 years of people reporting sightings of owl nests to the Montana Natural Heritage Program. Surveyors focused efforts on areas where they had the highest likelihood of detecting an owl, rather than just wandering randomly across steep, forested mountains trying to find the elusive raptors.
Great gray owl surveys
2019–2020
Kalispell
MISSOULA
HELENA
Butte
Bozeman
Blue rings indicate where an owl was detected either by the listeners or the recording devices.
It turned out that about 1 in 5 survey stations in prime habitat were occupied by great gray owls, a high occupancy rate for the territorial raptors. When listeners or recorders were in prime habitat, there often were detections. Both the high occupancy and high detection rates indicate that great gray owls seem to be where scientists predicted they would be.
The green areas show where scientists predict that great gray owls have the highest probability of occurring in Montana (the darker the shade, the higher the probability). This analysis, along with high detection rates, indicates that the owls are widely distributed across suitable habitat in western Montana. Because inadequate distribution is a main reason a species is designated as "of concern," as is the case now with the great gray owl, these results could mean that the species is in far better shape than previously thought.
Recorded audio call sites
Human audio call for owls
Owls detected by humans or audio recordings
Predicted occupancy of owls
Scientists found that surveyors or recorders usually did not detect owls in areas with the least suitable habitat, such as the Bitterroot Mountains, but usually did in areas of most suitable habitat, such as the Tobacco Roots.

Only by scientifically documenting the Northern Continental Divide Ecosystem (NCDE) grizzly population growth and range expansion will Montana be able to make a convincing case that the population is fully recovered and can be safely delisted and returned to state management authority


NCDE grizzly population
2004–2021
Upper population estimate
Estimated grizzly count
Lower population estimate
1,300
1,200
1,100
1,000
900
800
700
2004
2006
2008
2010
2012
2014
2016
2018
2020
No one had a good handle on the NCDE grizzly population size until the U.S. Geological Survey undertook a mammoth project in 2004 that sent volunteers deep into bear country to recover hair. The hair DNA was analyzed to identify individual animals. That number, 765, was more than twice what federal biologists had previously estimated.
FWP surveys since 2004 show that the population is growing steadily, one of the major prerequisites for federal delisting.



This map shows how the NCDE grizzly population has steadily expanded far beyond the recovery zone boundary set by the U.S. Fish and Wildlife Service in 1993.

KNOWLEDGE GAPS

Answering such questions is one reason FWP and other wildlife agencies constantly work to improve the scope and accuracy of counts. In the early 2000s, for instance, FWP biologist Rick Mace devised a way to use what was then relatively new DNA technology to survey Montana's black bear population across the species' 8,000-square-mile range. Volunteers set up scent stations surrounded by barbed wire that attracted bears. Snagged hairs later collected from the sites were sent to a genetics laboratory that identified a bear's species, sex, and unique genetic makeup.

The information showed that hunters were not overharvesting Montana's black bears, as researchers previously suspected. In fact, hunters were "hardly making a dent in the population," the now-retired Mace told *Montana Outdoors* in 2009.

FWP recently contracted with Hannah Specht, a post-doctoral candidate at the University of Montana, to improve how the department estimates the population and range of chimney swifts, black-tailed jackrabbits, and several other nongame Species of Concern for which the agency lacked inventory information. For great gray owls, Specht identified the raptors' prime breeding habitat—rugged, steep, forested terrain with tall conifers—and mapped areas where surveys could be done. FWP nongame biologists in each region then coordinated visits to the sites by volunteers and FWP staff who either listened for owls or set up devices to record calls. A resulting range of likely occupied habitat shows that the large owls are probably well distributed, in low numbers, in high-quality habitat within their range.

Kristina Smucker, chief of the FWP Nongame Wildlife Bureau, notes that documenting a species' numbers and range is essential to maintaining state management. "If a relatively uncommon bird like the great gray owl were petitioned for listing [as a threatened or endangered species] and we didn't even have the most basic information on where it is in the state and roughly how many are out there, there'd be a far greater chance that it would end up under federal protection," she says.

Gude notes that new techniques, technologies, and protocols are necessary because "we still don't know a lot about wildlife populations that we need to know," he says. "For example, we still don't have a good handle on elk populations in Region 1 [northwestern Montana] due to the thick forest cover. And we haven't found a way to count numbers and range of many nongame species, so we don't know how well they are faring."

Ken McDonald, head of the FWP Wildlife Division, adds that in many cases biologists can track population ups and downs but can't yet explain what drives the changes. "If we saw mule deer numbers dropping somewhere, we'd want to get in there and figure out why, so that, if possible, we could do something about it," he says.

Just like the individual animals themselves, wildlife populations are always in flux. Numbers and distribution constantly change in response to weather, disease, competition, and predation. To care for Montana's wildlife, biologists need to know how that wildlife is faring. "Without scientific monitoring, there would be no data to drive wildlife management," McDonald says. "We'd be left with little more than guesswork."

WISE APPROACH A new monitoring technique has allowed FWP nongame biologists to document a high occupancy rate of great gray owls and predict where the raptors live. The information shows that the forest owls may be in far better shape than previously thought.

TOP TO BOTTOM: TOM DICKSON; DONALD M. JONES

ESSAY

THE FINDERS AND THE FETCHERS

Like ice cream, bird dogs come in a variety of flavors.

Of the roughly 30 "sporting" breeds, some specialize in pointing at birds—coming to a complete stop upon smelling a live grouse, pheasant, or other upland species and aiming its snout toward the scent source, often with one paw slightly raised. Others are masters at retrieving birds—usually swimming after a downed duck or goose, or finding a dropped pheasant or grouse in the field, and returning the bird to the hunter.

Labrador retriever
JEFF MOORE

The joys of hunting (and living) with pointing and retrieving dogs.

BY DAVE BOOKS

Most sporting dogs aren't limited to just one skill, either. Some pointing breeds also retrieve quite well, while all retrievers flush upland birds and some, like pointing Labs, have even been bred to point.

Regardless of breed, they're all wonderful, with a sense of smell and other superpowers we humans can't begin to fathom. For example, how can a dog that is retrieving a downed bird stop and point another bird many yards away, as if the scent of the bird in its mouth doesn't exist? And how can a dog know that a bird flying away, apparently unharmed, actually has been hit with a pellet or two and should be followed, because it will soon drop to the ground? I've seen both happen more than once.

I started with a Labrador retriever more than 40 years ago, and now I'm on my fourth: a 13-year-old "British" black Lab named Bailey. She wasn't born in the British Isles but her forebears were, dogs with names like Turramurra Teal and Lochmuir Bonnie. She is a consummate waterfowl retriever, a strong swimmer who sits patiently at my side in the blind scanning the sky for ducks and geese.

I also own a 7-year-old Brittany named Tess, my fifth of that breed. Her ancestors came here from France a century ago, where they were once called "poachers' dogs" because they were small and easily concealed under an illegal hunter's coat. Like all pointing dogs, Tess runs like a rocket when turned loose in the field, constantly on the search for birds. When she gets a noseful of scent she screeches to a halt and stands stone-still, waiting for me to walk up and flush the hiding bird.

Knowing how much dogs love to chase things, I marvel at this stop-

Opposite page: German wirehair with a rooster
STEVE OEHLENSCHLAGER

Left: German shorthair locks up on a Hungarian partridge.
KEITH R. CROWLEY

Below right: Brittany pointing a pheasant
KEITH R. CROWLEY

Below left: English setter with sharp-tailed grouse
JACK BALLARD

and-wait trait that's been bred into pointing breeds—which include German wirehairs, German shorthairs, Weimaraners, Vizslas, English and Irish setters, English pointers, and wire-haired pointing griffons.

It doesn't always work out that way, though. I had one quirky Brittany named Ollie who might point perfectly all day and then suddenly decide to nose a bird into the air, well before I got within shooting range, for reasons of his own. Ollie was most lovable and I forgave his occasional transgressions.

Bailey, too, likes hunting upland birds, but in the field she takes the flushing approach. Once on the trail of a pheasant or grouse, she pursues it like a bloodhound, nose to the ground, never hesitating for a moment until the bird is in the air. Tess finds Bailey's failure to point and hold sinful and annoying, so I don't hunt the two together.

Hunting technique is not the only thing that separates the pointers and retrievers I've owned. Bailey, like most Labs, has never seen a meal she didn't like. She attacks her dog food as if she's starving, even though she could stand to lose a pound or two. Tess, on the other hand, is an indifferent eater and needs to be tempted with canned food or treats to maintain a healthy weight.

Pointers and retrievers are both intense and focused in the field because those traits have been bred into them for hundreds of years. But they make fine pets, too. The old idea that hunting dogs should

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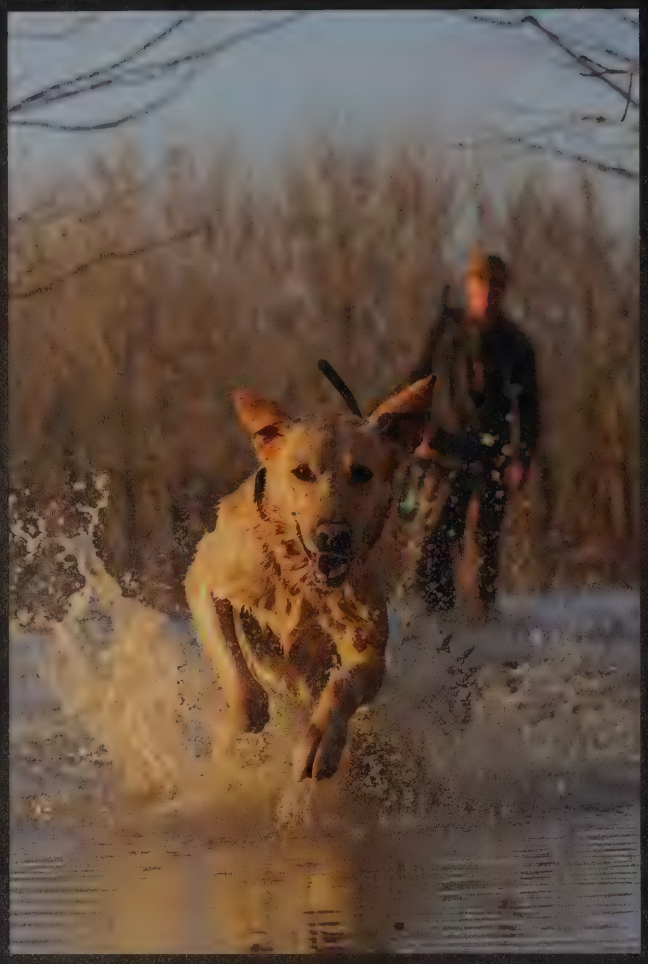
Dave Books was the editor of Montana Outdoors *from 1978 to 2002. He's the author of* Wingbeats and Heartbeats: Essays on Game Birds, Gun Dogs, and Days Afield.



Above: Yellow Labrador in a shallow marsh
KEITH R. CROWLEY

Right: Black Labrador with a drake mallard
DOUG TATE

be kenneled outdoors so that they don't become "soft" has long been disproved. These days even field trial champions live indoors and actually perform better because they form a stronger bond with their owners. More than anything, dogs want to please us and be a part of our family.

In my experience, retrievers are a bit more laid-back than pointers. If you share your home with a Labrador for any length of time, you'll soon know why it's America's most popular dog. Bailey generally stays out from underfoot and will happily nap the afternoon away. Tess, on the other hand, is a busy little dog in constant need of stimulation. She's either monitoring the yard for bunnies and songbirds or demanding to be reminded how wonderful she is by flopping on her back and asking for a belly rub. Bailey likes being patted on the head or getting scratched behind her ears, but she's perfectly content just to lie nearby when I'm working at my computer.

Pointers have been bred to cover ground quickly, searching out bird scent with great drive and energy. Some pointers make only so-so retrievers because they're more interested in looking for live birds than in searching for those already shot. Others make fine retrievers; it's hard to generalize because there is individual variation in every breed.

As is the case with other retrievers such as Chesapeakes and goldens, my Labs have been keen upland dogs as well as waterfowl retrievers, and all my Brittanys have retrieved well on land or water. Of course, late-season waterfowl hunting in Montana is a job best suited to breeds with thick, water-resistant coats. When Bailey and I

Left: Springer spaniel with a chukar (like other flushing breeds, springers are also bred to retrieve).
GARY KRAMER

Below: Golden retriever chasing a rooster
DENVER BRYAN

head to the river on icy December mornings, Tess stays in her kennel.

Like all Labs, Bailey has a strong desire to bring me things—tennis balls, pine cones, old bones, or anything else she can pick up and carry. She has a "soft" mouth and scarcely ruffles a feather on birds she retrieves. Once, when she was a pup, she ran up the hill near my house at dusk and began to bark. I followed, straining to see through the fading light as she came prancing toward me with something black and white in her mouth. Even before the scent hit, I knew what it was: a half-grown skunk from a family I had seen a few days earlier. I panicked and ran for the house. Bailey then dropped her little friend, which scurried away none the worse for wear.

Having tangled with many sharp-spurred rooster pheasants, Tess is not as gentle as Bailey when it comes to retrieving wounded birds. She usually gives them a quick bite on the head to make sure they won't give her any guff while she's retrieving them. But I once had a Brittany named Groucho who often brought pheasants back fully intact. On one long retrieve for a pheasant I'd dropped, he found the bird and started back to me with it in his mouth. Somewhere along the way he put it down to adjust his grip. Apparently, the rooster was barely wounded, for it promptly flew away. Groucho came back looking apologetic as if to say, "Sorry, Dad, I guess we're doing catch-and-release today."

Regardless of whether you choose a pointer or retriever, you can look forward to many years of fun and laughter. And yes, some tears as well, because our dogs inevitably leave us far too soon. It's the price we pay for their unconditional love and loyalty. As Rudyard Kipling

Retrieving breeds

Clockwise from top left:

Labrador retriever
LON LAUBER

Golden retriever
GARY KRAMER

Chesapeake Bay retriever
KERRIE TEE

Standard poodle
TEEMU TRETJAKOV

The author with his Brittany, Tess, and Labrador retriever, Bailey.
THOM BRIDGE

wrote, "Brothers and sisters I bid you beware, of giving your heart to a dog to tear."

When the time comes when you must say goodbye to your old friend, as I will have to do with Bailey before many more years pass, there is only one cure for the hole in your heart: another furry bundle of joy with puppy breath. And if you can't decide between a pointer or a retriever, why not one of each?

You can look forward to many years of fun and laughter. And yes, some tears as well, because our dogs inevitably leave us far too soon.

Pointing breeds

Clockwise from top left:

Vizsla
BRIAN GUEST

English setter
JESS MCGLOTHLIN

Wire-haired pointing griffon
CAT SIMPSON

Brittany
LISA WRIGHT

Irish setters
MIKE FOKKE

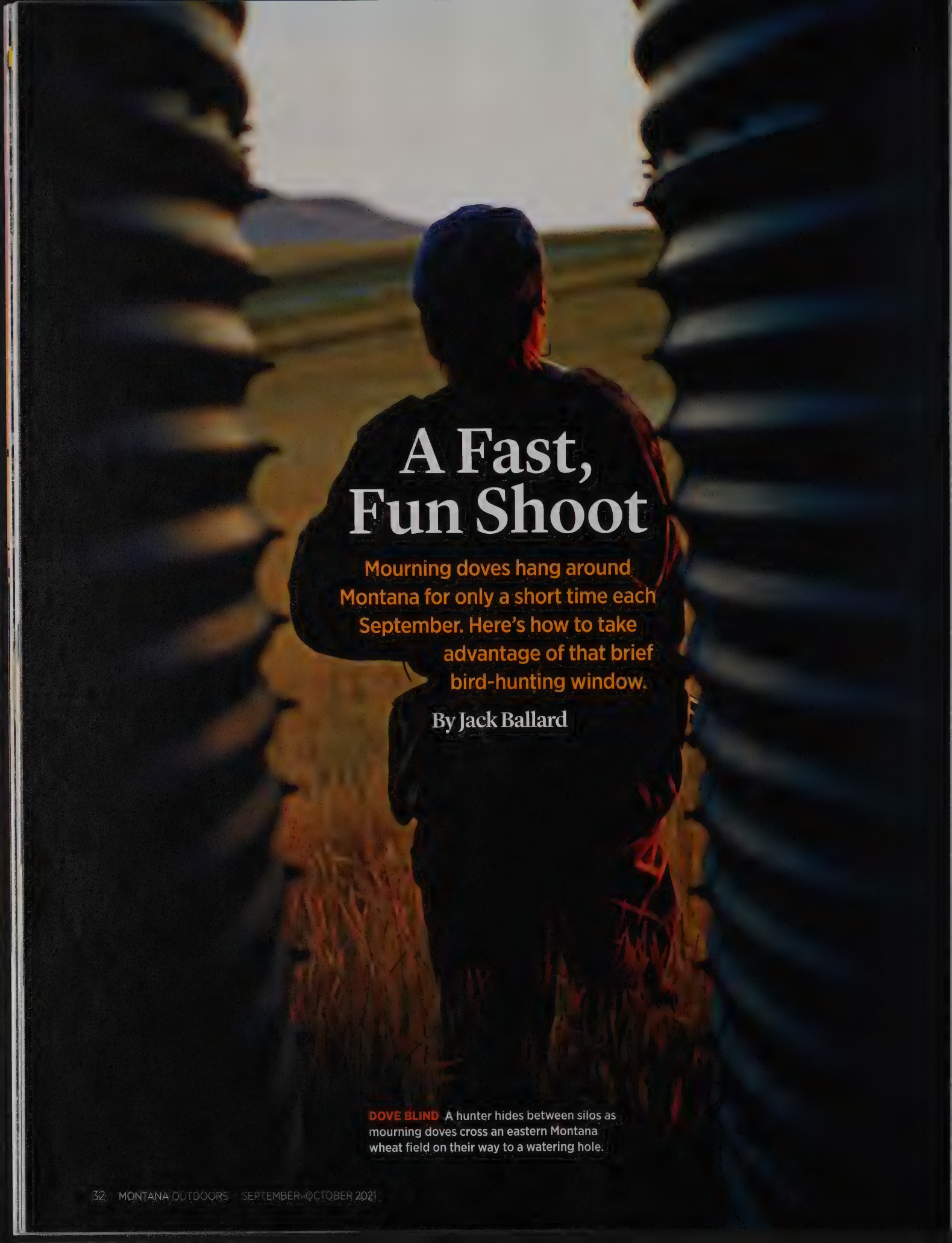
German wire-haired pointer
NATALLIA YAUMENENKA

English pointer
JELENA SAFRONOVA

Weimaraner
ARTEM BURDUK

German short-haired pointer
WAYNE HUGHES

French Brittany
STEVE OEHLENSCHLAGER



A Fast, Fun Shoot

Mourning doves hang around Montana for only a short time each September. Here's how to take advantage of that brief bird-hunting window.

By Jack Ballard

DOVE BLIND A hunter hides between silos as mourning doves cross an eastern Montana wheat field on their way to a watering hole.

The haunting *who-OOO-ooo-ooo-ooo* melody of a male mourning dove may sound sorrowful to the human ear. But the song is actually a mating call, a harbinger of life, not loss. A better rendering of the comely bird's name in relation to its voice would be "courting dove."

If reproductive rates are any indication, that courting call is exceedingly effective. Doves nesting in southern states may raise as many as six broods in a mating season; Montana "mourners" typically incubate one or two clutches. Although clutch sizes are small (typically just two eggs), the species' habit of multiple nestings makes them one of North America's most abundant birds.

Add the fact that they taste good and are fun to hunt and it's no wonder mourning doves top the charts in annual bird harvest nationwide. Dove hunters shoot 15–20 million mourning doves each year, according to the U.S. Fish and Wildlife Service. Second place is pheasants with 3.3 million per year, and third is mallards, with 2.9 million. Texas is the number one state for dove hunter numbers (200,000 or so) and annual harvest (about 5 million). Opening weekend of dove season there is a festive occasion celebrated by families and communities.

As is the case with waterfowl, the USFWS estimates annual dove harvest by asking a random sample of dove hunters, when they buy the required state migratory bird license each year (federal migratory bird stamp not required), to report the number they killed the previous season. To estimate dove population numbers and trends, state and federal biologists trap mourning doves each summer and affix aluminum bands to their legs. Hunters are urged to report harvested banded doves at reportband.gov.

Harvest information helps migratory bird managers set appropriate seasons and limits so that hunters don't overharvest doves and harm the population.

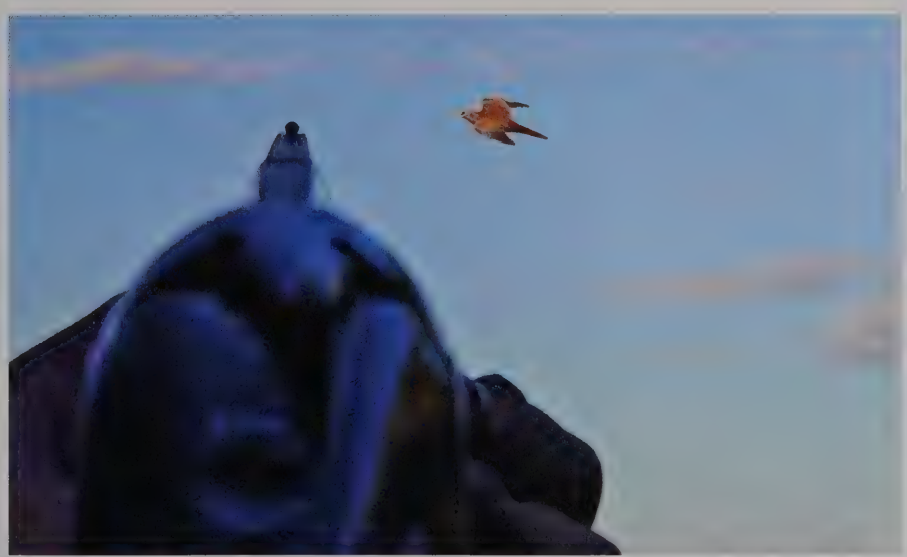
That's unlikely to ever happen in Montana, where mention of dove hunting is usually met with a *Huh?* Jim Hansen, Central Flyway migratory bird coordinator with Montana Fish, Wildlife & Parks in Billings, says Big Sky Country hunters harvest only about 10,000 to 20,000 birds every year, averaging 10 to 15 birds each. "It's not on many hunters' radar," he says.

It should be, according to Dave Books, an avid hunter from Helena and former editor of this magazine. Books, who has hunted doves for nearly 40 years, says one appeal is that dove hunting doesn't require much hiking. Most hunters simply locate a spot where doves fly at various times of the day and stand or even sit until the birds come to them.

Another is you don't need a dog. Doves don't "hold" for a pointer as upland birds do, nor are they nudged from the ground by a flushing breed. Though retrievers can be a big help in finding downed doves in heavy cover, "wounded birds don't try to run or swim away like pheasants and ducks and can usually be retrieved by the hunter," Books says.

Then there's the fact that you often get to shoot a lot. The daily limit is 15 birds, so hunters in the right place at the right time can easily use up two boxes of shells. And though doves fly fast, making them tough to hit, they succumb to very light bird shot, making any shotgun adequate.

"At first my friend and I mostly shot doves incidentally when out hunting sharptails," says Books. "Then about 15 years ago we started making destination trips to eastern Montana solely for doves." Books has found that dove numbers start to grow once he reaches central Montana and increase further as he nears North Dakota.



TOUGH SHOT Doves are notoriously tricky birds to shoot, owing to their speed and often erratic flight pattern—what the outdoor writer John Madson dubbed their "odd flickering quality" in the air. Using a box of shells to harvest just a few doves is not uncommon, especially for beginners.

Jack Ballard is an outdoor writer, book author, and photographer who lives in Red Lodge.

LEFT: LESTER A. KISH; RIGHT: COMPOSITE PHOTO BY JERRY NEAL/COLORADO PARKS AND WILDLIFE

HOW TO DO IT

If that sounds fun, don't dally. Although a handful of mourning doves winter in Montana if temperatures don't drop too low, most head south to the southern United States or Mexico at the first burst of foul fall weather.

"Doves start bunching up into flocks in August," Books says. "After that, they usually don't stick around long unless the weather stays warm." Dove season opens in Montana on September 1, and Books says the first week or so produces the most dependable shooting. "But sometimes bad weather will push them out early. We've hunted cold, windy openers and not killed a single bird."

Hansen, the FWP migratory bird coordinator, says Montana can't move the state's dove opener to an earlier date because the USFWS sets hunting season frameworks for all migratory birds, including doves. "Also, we still have doves caring for their young in nests in August, so we wouldn't want to move the season to when those adult birds might be shot by hunters," he says.

Dove hunting might be one of the few silver linings to climate change. Hansen says Montana hunters have more days to hunt than they did 20 years ago. "The weather is staying warmer later in September than it used to, so we typically get 10 or 15 good days in the season, versus just a few when I started," Hansen says.

TINY TROPHIES Mourning doves weigh only 4 ounces, so it takes several to make a meal.

To take advantage of this ever-widening window, Hansen says would-be dove hunters should scout early and late in the day, when the birds are flying. Look for sorghum, wheat, barley, sunflowers, or other grains or seeds, with tall roosting trees and a pond, stock tank, or other water source nearby. "You'll also want to locate the landowner if it's on private land to obtain permission," he adds.

Doves prefer ponds and tanks out in the open with no dense foliage nearby where predators might lurk. But Books advises novice hunters not to focus solely on water when setting up to shoot. He's had his best shooting from sites along the flight paths between water and crop fields or wild sunflowers.

Although doves are hard to hit—a lead of up to 6 feet is not uncommon—they have a thin skin and often drop if struck with even a single pellet. Most hunters favor No. 7½ shot. Hansen says that even though doves are migratory birds, nontoxic shot is not required except on federal wildlife areas. "But for hunters who prefer to use nontoxic loads, steel 7s and 6s work well," he says.

All this was news to me. Though I've been hunting ducks and upland birds since I was a teenager, I only stumbled upon dove hunting last year and have been learning as much as I can ever since.

LONJ LAIBER

The other doves

Mourning dove hunters will no doubt encounter two similar species. These non-native doves can be legally hunted and provide a dark, rich meat similar in color and taste to that of mourning doves.

Rock doves (pigeons) have inhabited Montana for decades. They're usually blue gray, but some also have white or reddish coloration. All rock doves have a dark beak and a white, cartilaginous protrusion atop the beak. As well as in cities and towns, rock doves hang around farmsteads and rocky outcroppings near fields. They are bigger and bulkier than mourning doves.

Mourning dove

Eurasian collared-dove

Rock dove (pigeon)

Eurasian collared-doves look a lot like mourning doves but are larger and heavier. They are more grayish than the tan-colored mourning doves and have a black "collar" on the back of the neck. Collared-doves are fairly new to the state but have dramatically expanded their range in the past two decades. Like rock doves, they mostly hang out in urban areas and around farmsteads, especially those with mature trees.

With the rapid range expansion of Eurasian collared-doves, many biologists worried the birds would displace native mourning doves. But in Montana that doesn't appear to be the case. "Competition with Eurasian collared-doves could be detrimental in local areas, but they tend toward cities and towns more than mourning doves, which mostly occur in rural areas," says Jim Hansen, FWP Central Flyway migratory bird coordinator.

FROM LEFT: NEIL & MJ MISHLER, SHUTTERSTOCK

FAMILY OUTING The author's daughter and wife with six doves taken in mid-September.

PRINTING OUT DECOYS

My discovery came on a block management area during opening day of bird season. Our English setter, Percy, found only a single covey of sharp-tailed grouse before it got too hot for him to continue. He and I headed toward home along a dusty gravel road that dipped into a low draw filled with brush and a few tall green ash trees. As I passed, I saw a dozen doves perched on a barbed-wire fence. A few more sat on the spindly upper branches of the trees.

Dog at heel, I ducked into the brush and sneaked to within range of a trio of birds lounging in a treetop. They flushed as we emerged from cover, and when my shot connected, Percy happily retrieved the downed dove. After taking three more birds, I noticed a stock tank brimming with water on the opposite side of the road. Not many minutes later a lone bird hurtled out of the brilliant blue sky to perch on a post near the tank. It then glided to the rim of the metal reservoir to drink.

After returning home, I called a friend from Tennessee who knows all about Southern bird hunting. "They'll hit that stock tank again this evening," Kerry assured me. "If you had some decoys it would sure help."

Dove decoys? Oh, right, I'll just run down to the general store in Red Lodge and pick up a dozen from their expansive selection. Ha, ha.

But then I went online and discovered a simple, cheap solution. On its website, Colorado Parks and Wildlife features a two-sided photo of a dove that can be printed, cut out, and pasted onto cardboard (see sidebar below). I enlisted Zoe, my college-student daughter, to help with the cutting and pasting, promising as reward an epic dove hunt. After just two hours we'd produced a dozen fine-looking two-sided, two-dimensional dove decoys that I protected with a quick spray of lacquer.

Late that afternoon, Zoe, my wife Lisa, and I returned to the watering hole on the block management area. Percy tagged along to help pick up birds, but his enthusiasm waned when he saw we weren't planning to head out on a long hike, as we usually do when bird hunting. After clipping the decoys to the wire fence around the stock tank, the three of us plopped onto folding chairs behind a screen of brush, and Percy lay down with a sigh.

Sure enough, doves came to the water, and some even seemed attracted by the very flat kinfolk we'd perched on the rusty barbed wire. But luring doves within shooting range is one thing; actually hitting one of these speedy birds is another altogether. After firing maybe 50 rounds total, the three of us managed to down a dozen birds. By no means was that enough to fill the freezer, but it was still plenty for a dinner of fried breaded dove breasts. Our sad setter, deprived of a romp across the prairie, even had a chance to show his stuff by retrieving a dove that fell into a tangle of chokecherries.

As for my daughter, wife, and me, we had a blast, despite all our misses. Pheasants, sharptails, and mountain grouse are still our preferred game birds, but we're pleased to now have another early season option. And the fact that we don't have to walk for miles to hunt doves means we can work on our wing shooting skills while saving our legs for the more arduous bird hunts later in the season.

Paper decoys mounted to cardboard can be clipped to dried plant stems, tree branches, or wire fences.

PHOTOS: JACK BALLARD

Make your own decoys

Doves are more likely to fly within shooting range if you post a few dozen decoys close to your hiding spot, especially if you are near or between crop fields and water. Plastic decoys are available online and in some of Montana's larger sporting goods stores, but you can make your own in a few hours if you have a color printer, scissors, glue, and cardboard. Find instructions for this fun and easy activity at coloradooutdoorsmag.com/2013/08/26/diy-dove-decoys/.

(Cautiously) Bringing Bighorns Back

FOR THE FIRST TIME IN 17 YEARS, FWP AND PARTNERS HAVE RETURNED WILD SHEEP TO HISTORICAL HABITATS.

By Andrew McKean

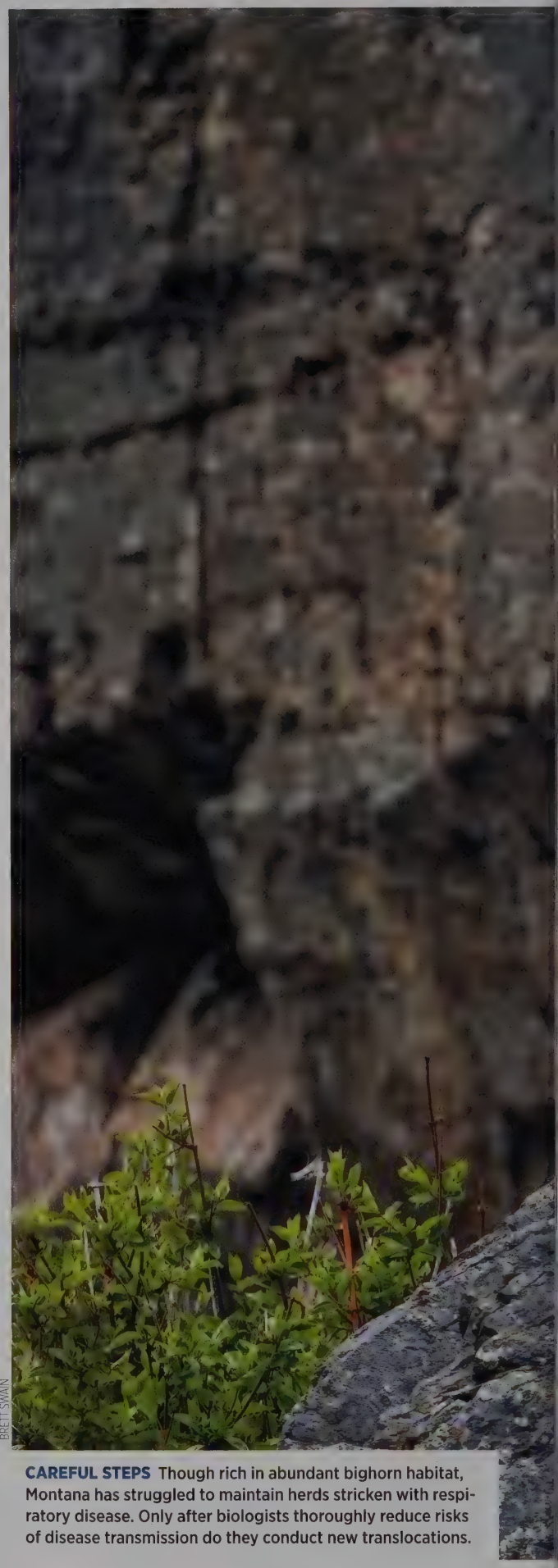
This past spring, Jay Kolbe shuddered every time his cellphone buzzed with an incoming text.

Satellite collars that he and other Montana Fish, Wildlife & Parks wildlife biologists had placed on bighorn sheep released months earlier in the Little Belt Mountains sent a "mortality" message if an animal hadn't moved for four hours. Kolbe, based in White Sulphur Springs, knew that a text likely meant only one thing: a freshly dead sheep. "It seemed like I got those texts every Sunday for two straight months," he says. "It got so that I started dreading the weekend."

When he received such a message, no matter the hour or weather, Kolbe would drive his pickup to an access above the gem-mining town of Sapphire Village, then hike as fast as he could into the cliffs and steep timber surrounding FWP's Judith River Wildlife Management Area. What he found rarely varied: a bighorn partially eaten by a predator, which he eventually suspected was a single mountain lion that had developed a taste for mutton.

In all, 15 of the 49 Rocky Mountain bighorns that Kolbe, his Lewistown-based colleague Sonja Andersen, and others had released into the Little Belts last winter were killed by one or more lions. Most were pregnant ewes.

The hunting editor of Outdoor Life *and a longtime* Montana Outdoors *contributor, Andrew McKean lives on a ranch near Glasgow.*



BRETT SWAIN

CAREFUL STEPS Though rich in abundant bighorn habitat, Montana has struggled to maintain herds stricken with respiratory disease. Only after biologists thoroughly reduce risks of disease transmission do they conduct new translocations.

The lion predation slowed and then stopped in May, as the surviving ewes retreated to sheer cliffs to birth their lambs. Biologists and other observers saw bands of ewes and their knob-kneed young moving to rimtop pastures and grassy parks where they spent the summer. They are the first bighorn sheep to occupy these places in more than a century.

Although the lion predation was alarming, says Kolbe, it wasn't unexpected. "It's a common dynamic when bighorn sheep are released in new areas," he says. "Eventually they learn to use escape cover and evade predators most of the time. So far, though, we're still 'in the black,' in that we have more sheep—post-lambing—on the mountain than when we released the first sheep last winter."

These sheep, five rams and 44 ewes, came from the south side of the Missouri River Breaks, some 80 miles from the Little Belts. They were captured in mid-December by helicopter net-gunners, fitted with satellite collars, then loaded into horse trailers and trucked to the Little Belts. The mountain range southeast of Great Falls contains ideal bighorn habitat like cliff topography and relatively shallow winter snow.

Native American pictographs depicting the curly-horned animals document historic wild sheep presence in the area. Computer models show that the high-quality habitat that supported those long-ago sheep still exists. "Bighorns were common here until the late 1800s, when unregulated hunting, disease, and competition with domestic livestock extirpated them from this isolated mountain range," Kolbe says.

Along with a concurrent translocation of 26 bighorns from Wild Horse Island in Flathead Lake to the Tendoy Mountains south of Dillon, these were the first attempts to reestablish new bighorn herds in Montana since 2003.

That's good news for wildlife watchers, hunters, and other fans of the high mountain scramblers. But it does raise a question: Why did it take so long?

> "Bighorns were likely here for a very long time."

PROOF IN THE PIGMENT Historical evidence that the Little Belt Mountains held suitable wild sheep habitat are pictographs showing the curly-horned mammals (right). Above: FWP wildlife biologist Jay Kolbe directs the release of bighorns into the range last December. Below: Kolbe, shown with FWP game warden Tylor Keeley tracking radio-collared sheep, says local hikers and hunters continually discover ancient skulls in the Little Belts, offering more proof of the area's suitability.

PAUSING TRANSLOCATIONS

FWP trapped and relocated bighorns for decades, beginning in 1939 with herds from the steep cliffs above the Sun River, on the eastern edge of the Bob Marshall Wilderness. These native wild sheep jumpstarted new herds in places as varied as the Missouri River Breaks, Rock Creek east of Missoula, Wild Horse Island in Flathead Lake, and the craggy Highland Mountains south of Butte.

Many of these places hadn't been trod by bighorns for more than a century. Other introduction areas may not have historically held wild sheep, but they had enough suitable habitat that biologists reckoned new transplants might thrive there.

Over the decades, FWP moved thousands of bighorns from occupied to vacant or thinly populated habitat in hundreds of separate

operations. Montana even exported wild sheep, sending Big Sky bighorns as far away as Oregon, Nebraska, and Utah.

But some relocated bighorns didn't survive. Over the years, several herds in Montana contracted bacterial infections causing afflicted sheep to develop pneumonia and other respiratory diseases. If they didn't suffocate from fluid filling their lungs, many were so weakened they became easy pickings for lions and other predators or failed to survive winter storms. Lambs produced by the remaining infected ewes often died within a few years.

One by one, disease nearly or totally wiped out the well-established Thompson Falls, East Fork, Rock Creek, Melrose, Tendoys, Lost Creek, and other bighorn herds. In some cases, wildlife biologists and game wardens took on the grim chore of killing ragged victims of sheep pneumonia, hoping to stem further outbreaks.

At first, wildlife managers suspected herds were contracting pneumonia after mingling with nearby domestic flocks. More recent research has challenged that assumption. Some infected populations had never been near domestic sheep, while bighorns in other wild herds occasionally mixed with domestics yet never got sick. "Yes, domestic sheep carry the pathogens that can cause pneumonia and other infectious diseases, but so do mountain goats and wild sheep," says Brian Wakeling, FWP's Game Management Bureau chief. In fact, some bighorns that carry pathogens never get sick, yet pass them to other wild sheep that do.

> **We didn't want to introduce bighorns where they could interact with and infect established herds. That didn't leave us many relocation options."**

FWP biologists and others are gaining a more nuanced understanding of how disease can be transmitted within a herd. The national Wild Sheep Foundation has helped fund research that looks at whether individual bighorns might be "shedders"—sheep acting as reservoirs of pathogens passed to their lambs and other members of the herd. "It could be that if we remove one or two chronic shedders—rather than the entire population—we will remove that disease risk," says Kurt Alt, conservation director for both the Wild Sheep Foundation and the Montana Wild Sheep Foundation, an independent affiliate. "The future of sheep management depends on better understanding disease vectors."

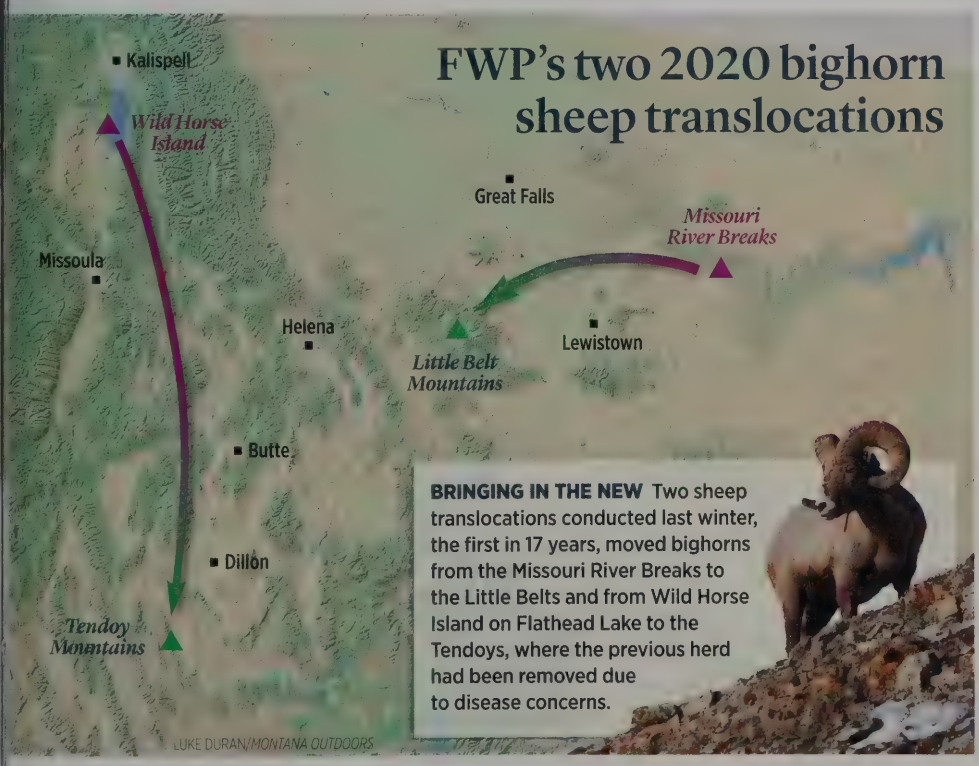
Wakeling says that because disease transmission remains unclear, FWP has "been very hesitant to do any new relocations for almost two decades." The concern is that if the department augments a diminishing herd with healthy sheep, it risks sickening the transplants or sickening the augmented population. "We've become conscious that we could end up moving diseases every time we move sheep," Wakeling says.

LIMITED OPTIONS

FWP's decisions about transplanting wild sheep are guided by the department's comprehensive bighorn conservation strategy document, completed in 2010. According to Kolbe, the strategy directed FWP to identify places where relocations might be possible, "but, because of disease transmission concerns, it recommends that we don't relocate sheep if domestic sheep or goats are closer than about 14 miles from the expected wild sheep range," he says. "Also, because relocated sheep could themselves carry the pathogens, we didn't want to introduce bighorns where they could interact with and infect established herds. That didn't leave us many relocation options."

One was the Little Belt Mountains, which contained vast amounts of high-quality, unoccupied habitat with no other bighorns nearby. Another was the Tendoy Mountains, a mid-elevation range along the Idaho border southwest of Dillon. But making this site suitable required drastic management action.

The Tendoys area received its first plant of bighorns in the 1980s, FWP's busiest decade for transplanting sheep. At first, the herd thrived in the range's grassy ridges and steep canyons. But after a few years, populations began to cycle "like a roller coaster," says FWP's Dillon-based biologist, Jesse Newby, as individual sheep sickened and died. "We


FWP's two 2020 bighorn sheep translocations
Kalispell
Wild Horse Island
Missoula
Great Falls
Missouri River Breaks
Helena
Lewistown
Little Belt Mountains
Butte
Dillon
Tendoy Mountains
BRINGING IN THE NEW Two sheep translocations conducted last winter, the first in 17 years, moved bighorns from the Missouri River Breaks to the Little Belts and from Wild Horse Island on Flathead Lake to the Tendoys, where the previous herd had been removed due to disease concerns.
LUKE DURAN/MONTANA OUTDOORS

added bighorns for a few years. Then 82 percent of the herd died in a single year."

FWP biologists concluded that all the remaining Tendoys bighorns likely carried respiratory pathogens, and adding more sheep to the range would be futile. Yet the mountain range was textbook bighorn habitat, holding great potential. So in 2015, the state depopulated the Tendoys using a combination of professional sharpshooters and permitted hunters to kill all remaining wild sheep and, with them, any lingering disease.

BUT WHICH SOURCES?

Meanwhile, biologists worked to identify appropriate source herds for translocations. One seemingly obvious choice were the bighorns on the north and south sides of the Missouri River and Fort Peck Reservoir in eastern Montana, which have thrived since Sun River sheep were put there in the early 1950s.

The Breaks bighorn population is the most productive in Montana, but unfortunately recent forensic pathology found evidence of past exposure to mycoplasma and *Pasteurella* bacteria, the main culprits in respiratory disease. That means Breaks sheep, celebrated for producing trophy-class rams, can't be used to augment existing populations. "It's one more complication we have to consider," says Andersen, the Lewistown-based biologist who manages the south side of the Missouri Breaks.

> **"The Montana Wool Growers Association and Montana Wild Sheep Foundation are respecting each other's realities."**

Yet another concern is that the prolific Breaks herds are outgrowing their habitat. That makes them susceptible to starvation from severe winters and disease outbreaks from overcrowding. One option is to continue controlling population growth by harvesting ewes. But because the area is so remote, hunters have a hard time taking enough ewes to keep numbers in check.

Another option is trapping excess Breaks bighorns and planting them in vacant habitat unconnected to existing herds. Which is why those 49 bighorns from the Fergus County portion of the Breaks were brought to the Little Belts last December.

Then in February, the Tendoys received 26 sheep from Wild Horse Island, a state park in Flathead Lake with a long history of donating bighorns to new herds. Cut off from disease transmission vectors, the island is Montana's only source of pathogen-free sheep. Because of the island's small size, FWP can't use public hunting to control numbers, so the herd must occasionally be trimmed by trapping bighorns and sending them elsewhere.

And these are some *big* bighorns. Already renowned by wild sheep fans for its monster rams, the island received international acclaim in 2018 when a resident ram that died of natural causes was discovered to be sporting horns that broke the world record.

Although potential source herds are routinely assessed for disease-transmission risk, even those that seem a perfect fit for a new site come with many unknowns. For instance, how will the Breaks and Wild Horse Island sheep, which come from herds that don't move around much, fare in areas like the Tendoys and Little Belts, where sheep traditionally migrate between summer and winter ranges? The satellite-connected GPS collars on newly transplanted bighorns will help biologists answer questions about how the newcomers use their new habitats.

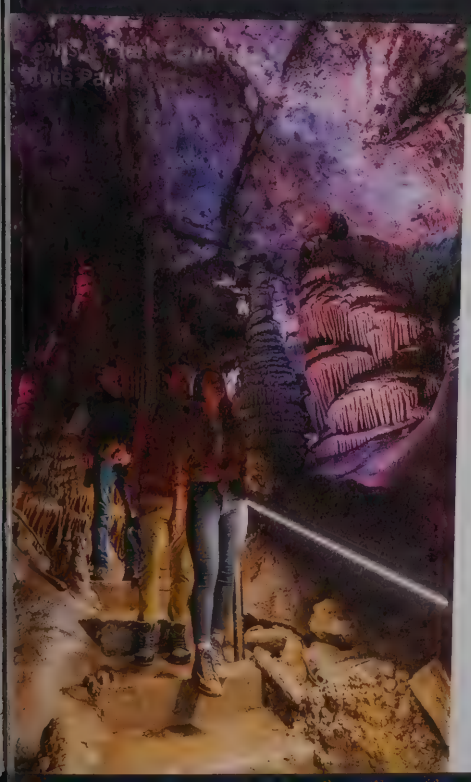
COOPERATION FROM MANY QUARTERS

Because domestic animals also can transmit disease, FWP consults with wool growers when evaluating any potential restoration project. Conservation groups and domestic producers traditionally haven't gotten along well, often arguing over the role domestic sheep play in bighorn respiratory disease outbreaks. But FWP officials note that the

Little Belts bighorns from above

Florida videographer and elk hunter Blake Pruitt met FWP wildlife biologist Jay Kolbe while hunting the Little Belts this past winter and learned about the recent bighorn translocation from the Missouri Breaks. He volunteered to accompany Kolbe to document lamb production this past spring. "The idea of going into that rugged 'sheep country' seemed like an adventure I just couldn't pass up," Pruitt says. Using a drone, he was able to provide footage of sheep in remote, inaccessible areas (see video still at far right). "The footage was essential in helping us confirm whether those ewes had lambs," says Kolbe. "We may try contracting with a drone pilot for additional monitoring."

To see some of Pruitt's amazing drone footage, visit youtube.com/watch?v=HV9Qiobasj0 or scan this QR code.



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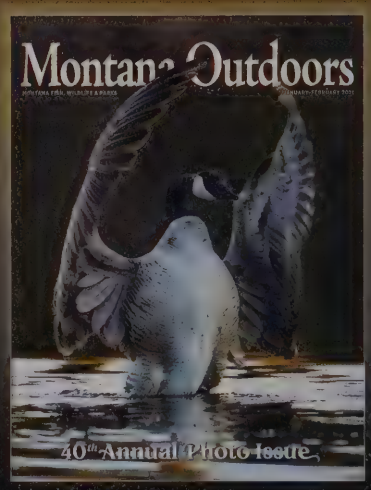

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OPERATION BIGHORN For both 2020 bighorn relocations, sheep were captured from source herds by aerial netters (left), then transported by helicopter (right) and trucks to their new homes. The animals were kept blindfolded (lower left) to reduce stress during transport and while biologists drew blood samples, took body measurements, and fitted some with GPS collars for tracking. Below right: The animals were released into the Tendoy Range and the Big Belt Mountains. Biologists later tracked the animals using radiotelemetry and even drones fitted with video cameras (see sidebar, page 40) to monitor whether ewes gave birth to lambs (bottom), further increasing populations.

Montana Wool Growers Association and the Montana Wild Sheep Foundation have been working cooperatively in recent years.

"They are respecting each other's realities—that domestic sheep are still a viable part of Montana's livestock economy and that hunters and wildlife watchers want to see more wild sheep on the landscape," says Quentin Kujala, FWP chief of staff. "In no other state have local wild sheep conservationists and local wool growers been able to develop such a healthy working relationship as they have here in Montana."

Because they are labor intensive and require helicopters, sheep relocations are expensive. The Breaks-to-Belts operation alone cost around $140,000. Helping fund the recent reintroductions were the Wild Sheep Foundation and its state chapter, the Great Falls Chapter of Safari Club International, the Montana Bowhunters Association, Kennetrek Boots, and the hunting gear and apparel company KUIU.

> **"The last thing we want is to put bighorns in an area, have them get sick, and then have finger pointing about the reasons."**

The projects also couldn't have happened without patience on everyone's part. "It's not surprising we haven't tried to establish a new herd in nearly 20 years," Kolbe says. "One reason is because all the easy restoration projects have already been done." Another is that it's taken time to develop scientific methods like computer models that predict how bighorns will fare in various habitat types, and to gain a better understanding of disease pathology. Kolbe says these tools allow biologists "to take a fresh look at unoccupied habitats and better evaluate which ones might hold promise for future reintroductions."

FWP's environmental assessment of reintroducing bighorns into the Little Belts

FROM ISLAND TO MOUNTAIN
Left: Wild Horse Island, a state park in Flathead Lake, holds some of the world's largest rams. The island is also Montana's only source of bighorns that don't carry pathogens that cause respiratory disease. In February 2021, FWP captured 26 Wild Horse Island sheep and transported them to the Tendoy Mountains (above), an area with prime bighorn habitat. Right: Three of the Wild Horse Island sheep leap from a transport trailer into the Tendoys.

suggests the range could support hundreds of sheep. Kolbe says a few dozen additional bighorns could be added from the Breaks as soon as this winter.

According to Alt, the groups he works for are eager to establish bighorn populations in other unoccupied habitats. He envisions Montana's sheep distribution extending from "North Dakota to Idaho, and from Canada to Wyoming."

While excited about the two recent reintroductions, and the potential for others, FWP officials say they will continue to rigorously evaluate any future proposals using the best information available—some of which is being gathered from these two recently reintroduced herds.

In other words: Let's be careful.

"We could drop bighorns all over the state in unoccupied habitats, but we have to take into account all the variables of reintroduction, including relations between wool growers, the department, and sheep hunters," Wakeling says. "The last thing we want is to put bighorns in an area, have them get sick, and then have finger pointing about the reasons."

Wakeling says he and other FWP managers would love to see more bighorns throughout Montana. "But when we recommend a release" he adds, "we need to use the best science and management to ensure those sheep have the best possible chance to thrive over the long term."

Big Horn Sheep
C. M. Russell
Oil on canvas
1904

Big game paradise

FWP wildlife biologists aren't the first to recognize the Little Belt Mountains, part of the Helena–Lewis and Clark National Forest, as a wildlife nirvana. "Shut off from the outside world it was a hunter's paradise bounded by walls of mountains and containing miles of grassy open spaces more green and beautiful than any man-made parks," wrote artist Charles M. Russell, recalling the environs of the cabin on the South Fork of the Judith River, where he lived from 1880 to 1882. "These parks and the mountains behind them swarmed with deer, elk, mountain sheep, and bear."

Jay Kolbe, FWP wildlife biologist in White Sulphur Springs, says the Little Belts are less well known by Montanans and tourists than nearby ranges. "They are the size of the Bob Marshall Wilderness complex, over 1 million acres of mostly public land. But they fly under the public's radar because they aren't as dramatic as the Crazies or the Bridgers," he says.

According to Kolbe, the combination of prime bighorn habitat and historical records showing that wild sheep previously occupied the range were major factors in selecting the Little Belts for a reintroduction. "We have archaeological records of pictographs showing bighorn sheep, Charlie Russell's journal entries, and bighorn skulls that people have found proving sheep were here," he says. "It's pretty exciting to bring back a charismatic species like bighorn sheep to so much habitat where they previously lived. It's a wildlife homecoming on a massive scale."

Visit youtube.com/watch?v=K6ML4TXurZU to see a video produced by FWP southwestern regional Information and Education Program manager Morgan Jacobsen on the Little Belt Mountains bighorn sheep release, or scan this QR code.

Leave no trace

By Tom Dickson

You should go hunting more often!

I can think of no words that bring more joy to a hunter's heart. Which is why I consider myself so lucky that my wife says or implies such sentiments each year while eating one of the many game dinners I prepare—and she's not just trying to get me out of the house!

The game meat itself deserves much of the credit. It's delicious, organic, and free range, harvested as humanely as possible. If you enjoy meat, it's hard to find a more sustainable source than a wild deer, pronghorn, grouse, or goose.

And I definitely work hard preparing delicious dishes. Though I'm not a trained chef, I realized early on that if I wanted Lisa to partake of my autumnal harvest, I'd better ensure that each meal was not just edible but irresistible. I'd grown up with the "add a can of cream of mushroom soup" or "pan fry until well done" approaches to game cooking. That never appealed to me, and I knew it wouldn't to her. So I bought cookbooks and went online to learn all I could about cooking game, from American, British, and European experts.

But I'm convinced the most important reason my once-vegetarian wife now enjoys eating wild animals is that I erase all trace of their origins.

This occurred to me during the first November we lived together. After shooting a whitetail one Sunday morning and hanging it in the basement, I called Lisa down to show off my prize. "Look!" I said, indicating where the bullet had entered at the deer's left armpit, then passed through its heart, then exited through the right shoulder, shattering the scapula.

Lisa gave me a disapproving look. "Thanks, but I really don't want an anatomy lesson with my food," she said, heading back upstairs.

I realized then that while hunters may marvel at the remarkable conversion of animals into meals—how a mallard that yesterday left an Alberta pothole can tomorrow evening be Roast Duck with Apricot Glaze served in a Helena dining room—everyone else prefers their meat to be clean of hair, feathers, blood, and backstory.

I get it. When I buy lamb chops, the last thing I want to see is wool stuck to the meat or read details of the young sheep's demise.

Since then, I've spared my wife all evidence of our game-dinner origins. I might show off the occasional fully feathered rooster pheasant I bring home, just because it's so beautiful, but only if the bird is fully intact.

Otherwise, I do all my butchering when she's gone, at the basement sink. Afterward, I vacuum up every remaining feather or hair. Then, with hot, soapy water, I wash away all traces of viscera, slime, and fat, getting down on my hands and knees to wipe up stray drops of blood. My goal is that, when Lisa returns, she won't see a single speck of gore that just a few hours earlier covered my work area.

Things stay clean and tidy during packaging, too. I trim all fat, sinew, and silverskin from each steak, chop, and roast, wrap the meat tightly in plastic wrap and white butcher paper, and seal it with freezer tape. Each package looks just like it came from our local grocer's meat department.

Some may think I'm contributing to the problem of people not knowing where their food comes from. Maybe so. But if my immaculate approach to butchering and packaging means Lisa and I continue to enjoy meals of game together, and that she actually urges me to hunt more often—every hunter's dream!—I'll promote game meat's illusion over its reality any day.

Tom Dickson is the editor of Montana Outdoors.

Marmota flaviventris

Yellow-bellied marmot

By Julie Lue

SCIENTIFIC NAME *Marmota* is Latin for "marmot," possibly derived from the French *marmotte* or the Latin *mus montanas*, or "mountain mouse." *Flaviventris* is a combination of the Latin words for "yellow" and "belly."

A few years ago, while driving through one of Missoula's busiest intersections, I saw something move near the road. Next to a gas station, a low, furry animal scampered across a triangle of lawn. It was a yellow-bellied marmot.

I couldn't believe it. Years ago, when I lived in Colorado, I thought of marmots as creatures of the high country, where I'd find them sunning themselves on boulders or romping across windswept meadows of wildflowers. But this one was hanging out in a city—miles from the mountains—surrounded by big-box stores, car washes, and fast-food restaurants.

I've since come to appreciate the versatility of these cat-sized rodents. While yellow-bellied marmots do live in subalpine and alpine zones, they also survive at lower elevations and even urban environments.

IDENTIFICATION

A close relative of the groundhog, the yellow-bellied marmot is a member of the squirrel family, weighing 5 to 11 pounds. It has short legs, a long and fluffy tail, and mostly yellow-brown fur with a yellow or rust-red belly and a whitish muzzle. Montana's other marmot, the hoary marmot, is bigger and grayer, and has black feet and white-tipped guard hairs that give it a grizzled appearance.

Both species are sometimes called whistle pigs for the sharp, high-pitched call used to warn other colony members of danger.

RANGE AND HABITAT

Yellow-bellied marmots inhabit parts of southwestern Canada and much of the western United States, including the western two-thirds of Montana. Sometimes called rock chucks, yellow-bellied marmots are usually found near rock outcroppings, boulder fields, or piles of rock and rubble cleared for construction next to meadows.

Human development does not seem to deter them, though when they get into barns and outbuildings they are often trapped and either killed or relocated. In Missoula, they live in the rocky riprap lining the Clark Fork River, including that infamous marmot often seen near the corner of Mullan and Reserve streets. "People call me about that one all the time, wanting to know if it's okay," says FWP nongame wildlife biologist Torrey Ritter. "I tell them it seems to have that busy intersection all figured out."

Where the range of the yellow-bellied and hoary marmots overlap, in far western Montana, the hoary is found at slightly higher elevations.

FOOD

Yellow-bellied marmots eats grass, flowering plants, and an occasional bird's egg. As fall approaches and temperatures drop, they concentrate more on calorie-dense seeds.

BEHAVIOR

Yellow-bellied marmots live in extensive burrow systems dug in the soil beneath rocks and boulders. Burrows provide a place for marmots to sleep, hide from predators, nurture offspring, and hibernate.

During the day, marmots frequently emerge from their burrows to eat, sunbathe, play, and fight or chase marmots from other burrows. Eating is serious business, as they need a thick fat layer to survive hibernation. Starting as early as August at some elevations, yellow-bellied marmots curl up with other colony members in a chamber lined with dried grass and fall into a deep sleep for six to eight months.

REPRODUCTION

Breeding season starts when the animals emerge from hibernation in spring. A female gives birth to three to eight pups and weans them about seven weeks later. Yellow-bellied marmots are relatively long-lived for rodents and can survive 13 to 15 years in the wild and more than 20 years in captivity.

Julie Lue is a writer in Florence.

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